

SAE *Journal*

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■ FRANK C. MOCK (M '11) first entered automobile engineering with the F. B. Stearns Co. in Cleveland in 1903. Later, he was engineer with Royal Tourist, Stoddard-Dayton, Jeffery, and

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BLUE PRINT for VICTORY



by O. E. Hunt*

Vice President, General Motors Corp.

It is our job and our privilege to help PERPETUATE THE NATION ITSELF by fully supplying our fighting forces with effective weapons for waging war and speeding victory and the return of peace.

These weapons of war—these implements of destruction—which we have already begun to produce—and which, from now on, we will produce in quantities that we, and we alone, are capable of producing—are very different from the products we have been building over the past years.

With the exception of military trucks, all war equipment differs more or less—and mostly MORE—from the products that our factories were originally set up to produce.

The machines of war are subject to more severe stresses,

strains and shocks. They must be built to withstand the unpredictable. They must be more accurately manufactured and more vigorously inspected. Upon these things depend the saving of human lives and the winning of victories for our country.

Broadly speaking, the various products that we are being called upon to make were not designed with mass production in view at all. In this country the design of military equipment has been for small lot manufacture—a tool room proposition, as it were.

That is no reflection on the Army and the Navy, but the American people are a peace-loving people rather than a war-minded people and the same applies to American industry.

For the past 24 years we have been laying our plans on the assumption of continued peace.

* Excerpts from an address made to the Automotive Council for War Production on Jan. 24, 1942.



Our building layouts and our tools of production have been evolved down through the years for the continued mass production of peacetime products, without thought of their adaptability to war work, much in contrast to the common practice in the war-minded nations.

Thus, the revamping of American industrial equipment to a war basis is a mammoth undertaking and we are confronted with many highly involved technical problems as we switch over to full time war production.

Actually this job of producing such radically different products was equivalent to starting new businesses, with new products—some new machine tools—new jigs and fixtures—and, in some cases, new buildings and new organizations.

The big point is that—while the overall technique remains the same—the detailed procedures must be worked out from the ground up.

Let me give you just one example of the great difference between war products and our peacetime products. In most people's minds, all gasoline engines are much alike. Actually, there is a tremendous difference between an automobile engine and an airplane engine. They both use gasoline, and they are both 4-cycle, but beyond that the similarity ends.

Just as a specific example, the machine operations on an Allison engine con rod as compared with a Cadillac con rod, illustrate the major differences:

There are 20 machine operations on the automobile rod against 97 on the aircraft rod—0.2 man-hours against 11 man-hours, 55 times as much.

The only point I'm making is that you can't just go out in the factory and talk these machines into doing things—you can't tell 'em to stop making this kind of thing—and start making this other kind of thing. It isn't done that way.

It takes work—hard work—detailed planning—a comprehension of the physical laws and all the practical processes of production. Rhetoric and conversation don't have much effect on these physical things and it's these physical things that are going to count from now on.

Other engine parts—machine-gun parts—pursuit-plane parts—bomber parts—tank parts—shells; in fact, most parts of all classes of war material present the same kind of problems as the airplane rod. Military products aren't regular products—airplane engines aren't car engines—

caterpillar treads aren't wheels—machine-gun mountings are not rumble seats, and cannons just ain't windshield wipers!

But it is most significant—most comforting to us as automotive engineers—as I believe it should be to the American people—that radical as is the change in objectives as we pass from peace to war—it is most significant that the experience and practice in manufacture and in change of type of manufacture developed and perfected in our peacetime work, over a long period of years, are, in a fundamental sense, **EXACTLY** the **EXPERIENCES** and the **PRACTICES** that are required to put our war production on a maximum basis and in a minimum length of time.

It is futile to think in terms of job shop methods which would produce a very few weapons more quickly—when the real need is for **QUANTITY PRODUCTION**—on a basis that will enable us to overtake—not only the Axis rate of production—but the stocks of war materials which they were accumulating long before the war started.

We must resist the temptation to make a "flash in the pan" showing which might be at the expense of the more important quantity objectives. The war can only be won with adequate totals and the right procedure doesn't involve any real loss of time.

This is tremendously important and we must see to it that the nation understands, so that our American people will not tolerate any tinkering with proven practice.

What are those proven practices? Well, let's take our practice of change:

Over two decades the organizations and plants, which you men represent, have been making annual shifts from old to new products.

Some people call it conversion. We call it retooling and rearrangement, and since nothing is gained by changing the nomenclature, I think we might just as well stick to the words we are used to. Once each year for over thirty years we have retooled and rearranged—changing over our plants—our machines—our equipment and our tools incident to the elimination of old products and the substitution of new products in an industry gaited to high rate manufacture.

The Posters

In This Article

... are in color and are available for display in factories and offices.

They were produced by the Information Division, Office of Emergency Management, Social Security Bldg., Washington.

Ask your local War Production Board office for copies if you want them.

These are official government photographs, and may not be used for advertising purposes.

Where necessary you have provided new buildings, new machines, new tools as a part of your regular technique, and you have taken it all in your stride – as a routine part of the day's work.

This has been going on behind the scenes year after year – quietly – without ostentation – and it is this technique of smooth scientific, meticulously planned, change-over – geared in with the principles of mass production – that has made our own American automobile industry the envy and the goal of all industries throughout the world – including, if you please, the Japs and the Germans!

This highly involved technique of change – this preparation to make something different – this *know how* – this knowledge born of intensive experience extending over a third of a century, is the one big thing that the automobile industry that was and is no more, has offered our country, which no other industry *can offer* in the same degree – and I want to say too, we have offered it gladly, we have offered it proudly – without equivocation or mental reservation of any kind whatsoever.

We *know* that it will win the war – we know that it is America's big ace in the hole – and make no mistake, the Nazis and the sons of the Son of Heaven know it just as well as we do!!

It is true, of course, that the transition from the building of peacetime products to war-time products demands changes more *radical in character* and *wider in variety*, but that in NO sense invalidates the case – rather it highlights the vital importance and the value of our experience in this time of emergency.

The groups of men who have established leadership in this *science of change* are obviously the ones best suited to apply their skill and experience in broader fields – and in a more radical way.

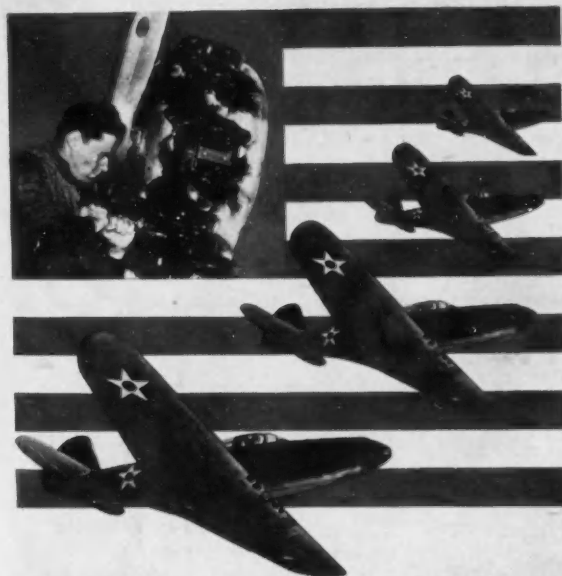
And our position of past and potential leadership places on each and every automotive engineer and manufacturer the obligation to provide new vision, eliminate all mental inertia, and inject new acceleration into our changeover techniques. This is especially true of those of us who are in the engineering end who plan the thousand and one technical details – the tremendous trifles, as it were – which must precede any mass production program.

Under the new conditions of war – with the necessity for changing over to a broader range of radically different products – most of which must be made in small volume with relation to automobile production totals – we must continue to speed up the process of change.

To be a bit more specific:

1. We must adjust our minds and our methods to the fact that weapons of war are subject to continuous change.
2. Drawing practices and tooling practices, formerly based on year round production at high volume, must be modified to accelerate the starting of production and to facilitate and expedite any necessary changes in the manufacture of war products.
3. We must outstrip our enemies – not only in the *quantity*, but in the *quality* of our war equipment.
4. Constant progress in the military effectiveness of our products must be accelerated and encouraged – not resisted.
5. Flexibility of mind – flexibility of equipment – flexibility of tools – are all vital to the accomplishment of these ends.

Maximum quantity of weapons of *maximum quality*



KEEP 'EM ROLLING!

produced by methods which lend themselves to *maximum progress* in military effectiveness – all tuned to a *minimum time* requirement – these are the very essence of successful mechanized war.

We must, for example, start building complete airplanes, and in this connection, there are some important points to bear in mind.

We are accustomed to doing things very differently from the airplane manufacturers but that does not prove that they are wrong and we are right. We have as much or more to learn from them as they have to learn from us. They have not had our mass production experience. Until the crisis they've never had a mass production problem, but they are plenty nimble on their feet – as is evidenced by the fact that they are accustomed to changing "models" every few months instead of every year.

From our viewpoint, their drafting room practice doesn't equal ours.

Shall we waste our time and theirs remaking drawings to conform to our own standards? Certainly not. We must start *now* from their rudimentary drawings and samples and revise their practice only to the degree that is absolutely necessary to adapt to our own men and methods.

Remember we've got a war on our hands and it's not going to be won by fancy tracings.

The die practice in the field of aviation is more "sketchy" than ours, but it has the advantage of flexibility and lends itself more readily to quick and frequent change. Shall we scoff at it, argue about it and try to completely change it?

Because of considerations of lesser quantities and the constant likelihood of change from military necessity, it would be far wiser to start from *where they now are* and improve on their processing as time goes on – after we have accumulated more experience in their particular field.

Time saving must be uppermost in our minds at all times – the meeting of schedules – and, if you please, the **BEATING** of schedules. We must adopt any modifications in our regular procedures that will contribute to those ends.

Fortunately, past experience has bred a flexibility of mind in our engineers that should make the lifting of their sights to this new vision natural and instantaneous. We don't have to change our mental approach, but we can do many things to *intensify it* and speed it up.

It may sound trite to say that cooperation is of tremendous importance. We must not only have the willingness to consider the other fellow's viewpoint, but full opportunities must be provided to exchange experiences and cross-check our viewpoints for the benefit of the war effort as a whole.

We should have:

1. Regular meetings of our Executives, where the frank disclosure of time-saving developments useful in getting things going quickly, can be made available to all.
2. Regular meetings of the engineers – our top engineers – where product improvements which each organization has accomplished may become the common property of all.
3. Regular meetings of our Process men, where their findings dealing with the speediest possible methods of getting these new pieces made, may be gotten into the hands of all their fellows.
4. We should do something along similar lines in connection with the service end – which I will discuss in a few moments.

Where new developments of a patentable nature, in either products or processing are involved, we should continue to disclose our improvements to our companions in

arms production. We should grant to these companions, for military use, and without remuneration the right to manufacture under our patents for the duration of the war and for, let's say, six months thereafter, in return for like rights flowing from them to us. We are no longer in competition. It's "One For All and All For One."

I said we are no longer in competition. I think I'd like to take that back because competition is the greatest spur to action and accomplishment that the human race has ever discovered. I know that may sound a bit old fashioned but it's **TRUE**. That's what made our industry so virile. That's what made it what it IS.

But we *are* still in competition. We are competing in the *biggest single contest that the world has ever witnessed*. We are jointly competing against three other guys who've got it into their heads that they are the Champs. Yes! We need all the competitive spirit that we can muster – even more than we had back in the good old days when Dodge and Pontiac . . . Cadillac and Packard . . . Ford, Chevrolet and Plymouth . . . were engaged in an all-out battle of rhetorical barrage.

And we still need competition among ourselves – or perhaps I should say a constructive rivalry to outdo one another in helping the home team win this new brand of world series.

Inter-company sale of available machine tools and of tool-making capacity available and needed for war projects are among the policies already adopted and now in effect.

I have talked a bit already about engineering and what our attitude should be in regard to speeding it up. Now a word about processing. In our peacetime mass production we have demonstrated the economic value of using only the most efficient type of machine for each operation. This policy has become a part of our mass production philosophy.

In war, having the needed material in time is the all important consideration. Nothing is more costly than a war lost through lack of needed defense weapons. For that reason, and because of the critical shortage of machines, we must revise our normal policy and use any machine and every machine available that is *reasonably* adaptable to the job at hand.

All of us are already in action on this policy – but, in the interest of greater speed, its possibilities should be capitalized to the utmost.

I would recommend, in this connection, that a corps of machine modifiers be assigned to the job in each major activity with a proper set-up for exchange of practice and experience under the auspices of this group.

Again, in connection with machine tools, where machining at a number of points on large pieces is involved, it would be most constructive to abandon our small piece practice – namely, moving the piece from machine to machine for each operation.

Instead, we should set the piece up in a fixture with individual heads that will perform all the operations in one set-up.

Now I want to say just a word about what we, in our regular business, call Service – the job of seeing that the product gets a full opportunity in the hands of the user to do the job it was designed to do.

Every engineer – or at least every good engineer – has always looked upon service as his right bower.

First, it's our responsibility to check up on how our stuff is performing in the hands of the user – in this case, the boys at the front.



Second, a keen active interest in service is the quickest and the surest way to uncover shortcomings and find opportunities for improvements in design.

In commercial work these duties are recognized and accepted. In war—particularly if the product is not of the producing organization's own design—the follow-up beyond the production stage is very apt to be forgotten.

In war and even in peace—but certainly in war—I believe we, in the engineering end, should take the position that our responsibility does not end until the product has been worn out in the hands of its user performing the service for which it was intended—and with a minimum of expense in time lost and at the lowest possible upkeep cost.

The engineer should constantly seek and readily accept from others suggestions for changes in design and process that will insure better and better values resulting from the production cycle. He should take a live interest in teaching the user the manner of use and the type of care of the product that will insure the best results. He should see that those who have the responsibility for maintenance and repairs have proper parts and know how to install them. He should finally be on the alert and hold himself in readiness to redesign bits that need to be redesigned.

We could, of course, take the position that since we are not responsible for the original design, we are not responsible for its performance in the field, and that it's not up to us to find ways to improve it.

And we could take the position that the training of the men to use the equipment is up to the Army, and that we have no responsibility in that connection. We could say "let them decide on the percentage of spare parts they are going to need. Let them worry about the distribution and the installation."

We could stay in our offices and stick at our drafting boards and keep away from the front where the dependability and effectiveness of our products may mean—in fact WILL mean—the difference between short war and long war—or for that matter, it might possibly mean difference between VICTORY or DEFEAT!

Brig.-Gen. Stephen G. Henry, who directs training of the maintenance personnel in the armored forces, has aptly pointed out, "That army finally wins which has the best remnants."

Keeping the Army's mechanized equipment at the highest possible fighting effectiveness is vital to success in mechanized war and we, of the automotive engineering group, cannot short-change our responsibilities.

It's a driver's training school job, a service school job—a job in maintenance engineering and because of the newness of the designs—the engineer must assume an important part in helping to get the job done.

Of course, the training of the vast personnel that's going to use the mechanical equipment must finally be done by the Armed Forces.

We couldn't possibly take on the job of putting 7,000,000 soldiers through our factory training schools.

But it is very definitely our obligation to offer our service in the preparation of the type of information that will enable the Army to speed up the training job.

Such information, although of a technical nature, must be developed in readily digestible form. We must remember that the mass of men that the Army is being called on to train includes all kinds of people, technical and non-technical, ranging from engineers to ribbon clerks. From



the ranks of the latter may come some of our best soldiers if *we* will do the kind of job *we* ought to do.

It is up to us to volunteer our services and help operate the schools to train the Army's instructors who must train the rank and file in the proper care and use of the machines we furnish.

Remember military training is a very different proposition than it was 25 years ago—mechanized warfare has made it so. It's far more than a matter of teaching men how to salute and march in step.

On the parts supply side, we must recognize that our recently streamlined Army has not yet had the opportunity to gain a proper experience in flowing the right parts, in the right quantity—at the right time—to the constantly changing theaters of war, far from the sources of supply and, in consequence, it's up to us who have had commercial experience on this general type of problem to offer our full cooperation and help them even to the point of taking over the boxing and stocking and getting them on their way to the fighting lines, in any way that we can be of help. We must even be prepared, if wanted, and I am sure we will be wanted, to take over the operation of reconditioning plants in proximity to the fighting front. On top of all this, we must recognize that some of the equipment that we have furnished is new in design, has never had the service tests to which we would normally subject our products before delivery to the user.

Since the field of battle is the only adequate proving ground, we must be prepared to send qualified technicians to the front—or maybe I should use the word "GO" instead of *send*. Some of us must actually GO to the front and stay on the front, so as to report the engineering facts on any weaknesses that may develop, to the end that they may be corrected more quickly in production, as well as on products already in service and en route.



Rationing Programs Are Based On Long Studies of War Needs

TOMORROW'S pattern of stringent rationing stems from long studies, begun in some cases more than a year ago. The pattern, in general, is a mosaic of orders, amendments, interpretations, and other regulations "masterminded" by a relatively small group of men who believed *then* that we would be facing tough times *now*.

Tire rationing rests on four documents, each of which has as firm a foundation of legal background as defense attorneys have been able to develop. They are:

- Supplementary Order M-15-b (Jan. 23) to restrict the use and sale of rubber. This was based on the Rubber Order (M-15, June 20, 1941) and several amendments, which in turn was based on the theory of curbing the use of critical materials for non-defense manufacture, as outlined in the first materials (M) order, banning certain uses of aluminum (M-1, March 22, 1941);

- Supplementary Order M-15-b-1 (Feb. 11) the first order limiting the percentages of crude rubber permitted to be mixed in the manufacture of certain rubber products;

- Directive No. 1, (Jan. 27) War Production Board, vesting in the Office of Price Administration full authority for rationing all goods sold at retail. Supplementary orders and directives are expected to cover wholesale and other distribution channels where necessary, should such controls be needed to make rationing effective, and

- Tire Rationing Regulations (revised, Feb. 19) which was based on the regulations of Dec. 30, 1941, and WPB directive No. 1. (See "Rationing," page 21.)

In its simplest terms consumer goods will be rationed thus:

$S - (ANLL)$

$\frac{A}{x} = x$, where

A
 S = total estimated U. S. supply in sight;

$ANLL$ = estimated requirements of the Army, Navy, Lend-Lease, Board of Eco-

The Law And Rationing

THE FIRST court actions brought by OPA in connection with rationing were won by the Federal Government, upholding the right of Leon Henderson to ration tires.

- A restraining order was brought against a dealer in Norfolk, Va., to stop him from delivering a car and tires.

- The Federal grand jury in Indianapolis returned a criminal indictment against an automobile dealer and its owners for making false statements to the government. Ten years and a fine of \$10,000 is the maximum if the defendants are found guilty.



nomic Warfare, and other government agencies;

A = estimated number of consumers. In the case of tires, most of the peacetime consumers are consumers no longer;

x = what you get.

In the case of rubber, total estimated U. S. supply (S) took a sharp drop with the bad news from the Pacific battle area. Only heroic efforts by OPM's (now WPB's) Materials Division has given the dark rubber cloud a silver lining—and that lining is desperately thin, WPB officials agree. (Stockpiles are military secrets.) Considerable controversy has been injected in planning to raise rubber supplies through vegetable and petroleum substitutes for natural rubber.

(Continued on page 24)

Getting War Work

CONTACT your local Army, Navy, or WPB offices for information about war contracts, U. S. procurement officers urge. Procurement routines have been shortened in the interest of speed since Pearl Harbor, but:

1. If you want government business you must do a selling job. Many automotive industrial salesmen face losing their jobs. Most are equipped by background and experience to contact these local offices.

Local procurement offices are collecting valuable information showing how peacetime manufacturers are doubling their factory forces in face of absolute curtailment of materials for civilian products. But:

2. Those manufacturers who get the business must show the ingenuity in retooling that put them in business in the first place, and kept them in business.

Subcontracting is an open field, but:

3. Often a subcontract can be negotiated only if the subcontractor is willing to sublet operations or parts to other companies in his community. Experienced salesmen are valuable in this phase of government procurement if they will look up other manufacturers who can make the needed parts or do the needed operations.

Few of the tens of thousands of armament items are "catalog products." Most are entirely new to the manufacturers who must make them. Automotive engineers have never been called upon to exercise as much ingenuity as they have today, procurement officials told the SAE Journal.



Older Engineers Needed by U. S.

WHAT can automotive engineers above the draft age do in this emergency?

Selective Draft officials have always maintained that the "production army" back home is as essential as the fighting forces in training and combat.

Here is official advice:

1. If you are in essential work in a defense plant, stay on the job.

2. If, in your opinion, your work is not essential, shift to some other engineering task which will contribute to winning the war.

3. If your company is not engaged in defense work, change jobs if possible and get into war manufacturing. These hints are offered by Selective Service to SAE members:

- Subcontracting is becoming a major necessity. Many SAE members are qualified to act as liaison production engineers.

- Many Army, Navy and WPB officials are looking for experienced automotive engineers to work on redesign and production problems. Such men are hired as consultants on a *per diem* basis, or as civilian experts on the various staffs, or as commissioned officers. Full statement of your qualifications should accompany your applications. Apply by letter to the Commanding Officer of your local Army Post, the Corps Area, the Commandant of your local Naval District, or to the local office of the WPB.

Arms Contracts Are Speedier

PROCEDURES in issuing war contracts have been speeded by Army, Navy, and War Production Board officials since Pearl Harbor, and government procurement specialists are working far into the nights to speed official buying more into line with commercial practices.

Business men are prone to criticize government "red tape" in procurement. However, military regulations are based largely upon laws, many of which were passed by Congress long ago to prevent excessive costs to the taxpayer. Some of the acceleration already has been achieved by executive orders and some new "enabling" legislation is in process in Congress.

In their own areas of authority, government procurement agencies have:

1. Ordered increases in the amount of contracts. For example, local Army procurement officers were imposed with a limit of \$½ million on any one contract prior to Dec. 23, 1941. Anything over this amount had to be cleared by the Under Secretary of War. Then the limit was set at \$5 million, with anything over \$1 million to be cleared through WPB. Navy procurement has been speeded along the same lines.

2. Chiefs of Army supply arms and services may now make advance payments up to 50% on contracts under \$5 million, 20% of which may be advanced to subcontractors.

3. Organized their local procurement offices to speed up the dissemination of:

- a. Detailed information about specific contracts.

- b. Studies of production. In a number of the military services, a prime contractor is asked to submit an analysis in detail on production, including retooling, layout of plant, time studies, and inspection procedures.

- c. Recommendations for increasing output by decreasing manhours of labor.

- d. Recommendations for reducing the amount of scrap in specific operations.

- e. Recommendations in respect to redesigning a part or a product to increase efficiency and cut costs.

In the meantime, the War Production Board, through the experience of its executives in 18 months of OPM operations, has instituted many shortcuts in procurement.

A statement submitted by Douglas C. MacKeachie, WPB director of purchases, to a special Senate committee recently outlined the Board's three-part program:

1. Negotiated contracts will be more numerous, competitive bidding will be less frequent. Thus, he said, the government will take advantage of the best production facilities. Furthermore, a great amount of detailed work, hence time, will be saved between the initial stages of procurement and getting the production line into full swing.

2. Smaller manufacturers will get more of the standard commercial items, and the harder and more difficult tasks, usually involving considerable development engineering and redesign, will be put up to the larger companies better equipped to handle this type of work.

3. A standard clause for renegotiation, under stated conditions, will be included in contracts. This, he said, was in line with the Second War Powers Bill, now in process of legislation. This renegotiation provides the indication of a manufacturer's books to see

(Continued on page 24)

Rationing

CIVILIAN RATIONING is being administered by the Office of Price Administration, headed by Leon Henderson. Authority was granted in a sweeping order, Directive No. 1 of WPB, signed by Chairman Donald M. Nelson and approved by the President on Jan. 24. Rationing will be handled thus:

PRODUCT

Automobiles

Taxicabs

Buses

Ambulances

Fire engines,
police cars,
city trucks

Tires, auto

Tires, taxicab

Tires, truck

Tires, truck

Tires, buses

Gasoline

ADMINISTERED BY

Local rationing boards, OPA.

Local rationing boards, OPA.

Transportation & Farm Equipment Branch, WPB, by authority delegated by OPA, which got its powers from WPB in the first place through Directive No. 1.

Local rationing boards, OPA. (Preferential).

Local rationing boards, OPA. (Preferential).

For individual owners, through local rationing boards, OPA.

Local rationing boards, OPA.

Individually owned, local rationing boards, OPA.

Fleet-owned, ODT through local ICC offices.

Transportation & Farm Equipment Branch, WPB.

(See "Gasoline Rationing," page 22).

Official "rationeers" thus far do not see any need to ration replacement parts, trusting that restricted use of passenger cars will solve this problem. However, both the Automotive and the Transportation & Farm Equipment Branches, WPB, and the Office of Defense Transportation are studying this problem with view of proposing a plan for parts rationing.

Scarce Materials In Armaments Face Conservation Curbs

REDUCING the amount of scarce materials in armament is a definite policy in the War Production Board, government officials tell the SAE Journal. Whether enabling legislation is approved by Congress or not, WPB officials are going to do something about it, and both the Army and the Navy already are engaged in effective and widespread conservation programs.

For years military designs have been sacrosanct, but for years Army and Navy products have been purchased on a relatively small scale and until the defense program the few manufacturers supplying the Army and Navy have not been pressed for such gigantic deliveries.

The wide powers delegated to Donald M. Nelson by the President have given the WPB chairman sufficient authority to go the limit in standardization and redesign, if in his opinion such steps will get things made faster.

Official sources in Washington agree that Ernest C. Kanzler, the new head of the Automotive Branch, WPB, will get full backing of the Army and Navy in any suggestions as to redesign, despite the many federal laws to the contrary. Among these are:

1. Anti-trust legislation, which has worried many an industrialist who would otherwise have discussed ways and means with competitors of achieving faster production, and

2. The laws surrounding the specifications and rulings of the Federal Specifications Board.

In the final analysis, the question of violating laws to achieve faster armament production is one which WPB will decide, several WPB officials told the SAE Journal. "After all," one veteran of OPM days said, "I can't afford to think of the law when all of us up to the President himself know how deep the Pacific Ocean is behind MacArthur's lines."

Another government official, in an off-the-record remark, said:

"I suppose that all of us who have been here a while have violated enough laws to spend the rest of our lives in jail. But my son may be headed today to some combat area for all I know, and he will be needing a tank, or a gun and ammunition, or something. That's why I had to put off seeing you until so late tonight. That's why I'll be here until after midnight and be back here in the office most of Sunday."

"Every time a Liberty ship is commissioned she would be loaded down to the gunwales with broken statutes if we didn't have 'legal blind-spots,'" another government official said. "I'd hate to think of justifying peacetime practices in this man's war—we'd be a pushover for the Japs and Nazis. Besides, I can't understand legal verbiage—my business then and now, was and is steel plates and rivets."

The WPB Silk Order (M-22) provides that after March 1 the grade of fiber must be approved by the Defense Supplies Corp. to make sure that top grades are reserved for parachute canopies, and not to be used in shroud lines.

Gasoline Rationing Looms; Experts Studying Program

CONTINUED sinkings of coastwise tankers by the enemy submarines may require rationing of gasoline soon—particularly on the Eastern Seaboard.

Already the Office of Price Administration has wide rationing powers (See "Rationing," page 20) and several OPA "rationeers" have been studying administrative problems involved. On the other hand, several officials of the Office of the Petroleum Coordinator, headed by Secretary Harold Ickes of the Department of the Interior, have been studying gasoline rationing.

Jealousies over prerogatives loomed until Coordinator Ickes told the House ICC committee that he had discussed the problem with Leon Henderson, the nation's No. 1 "rationeer," and that the latter would look to the former for "signals." It looks like teamwork, particularly in view of the fact that Mr. Ickes is a man of known slam-bang individualism.

With this cooperation, it seems likely that there is an excellent chance for equitably working out the details of this complicated project. Many officials have privately expressed the view that gasoline rationing in a country as large as the United States was "impossible." Several, interviewed by the SAE Journal since Pearl Harbor and the fall of Singapore, have changed their opinion to "it must be done."

If the local Tire Rationing Board experience is successful, these boards may be expanded to handle gasoline. It may be that the sugar rationing experience, where coupons are being issued by local schools, may set the pattern. In any event a schedule of requirements by classes of users will be set up, permitting those who use their cars for business to have more than those who use their cars for pleasure only. If the situation on gasoline supply becomes acute, the latter may be dropped, but channels through which appeals can be made will be left open.

Office of Defense Transportation officials believe that they can and should ration gasoline to truck fleets. This they believe could be done through the local inspection offices of the Interstate Commerce Commission, of which the ODT head, Joseph B. Eastman, is chairman. This organization is expected to ration trucks.

However, most of the trucks in the U. S. are owned by operators of from one to five vehicles, such as farmers and small businesses.

Opposed, too, are the opinions in respect to policing possible hoarding of gasoline, should use of the fuel be curtailed. Some believe that effort should be made at the outset of the program to inspect all garages, both private and public, as well as homes of car owners to check on stores on hand. This appears too gigantic a task to others who believe that two characteristics of gasoline will make it self-policing:

1. Gasoline is an explosive. Local municipal ordinances and property insurance policies prohibit the unlicensed storage of explosives.

2. Stored gasoline tends to gum. Furthermore,

3. Storage space for even a month's supply would take up too much room, with tanks, steel drums and other facilities which are on priorities. A month's supply of gasoline would be harder to hide than a month's supply of sugar, for example.

Emergency Tire Plan

PLANS are being worked out by OPA to provide truck and bus fleet operators with emergency ration certificates so that essential long-haul trucks and buses will be able to replace blown tires and tubes on the road.

The program also applies to Federal, state, county and large municipal fleets, but will not broaden the existing eligibility list, as outlined in Section 404 of the Tire Rationing Regulations. National tire and tube quotas will not be raised.

Under the plan, OPA will arrange for the issuance through local rationing boards of a supply of emergency certificates to operators of fleets of 20 or more trucks or buses equal to a fixed percentage of the number of tires and tubes now in active use on the road on eligible vehicles. Fleet operators, upon obtaining a number of emergency certificates limited to the needs of their eligible vehicles, could purchase the permitted quantities of tires and tubes at once and place them at convenient points along their routes, or retain certificates for use as needed.

Needs More Data

Before final details of the plan can be determined, OPA Administrator Leon Henderson said, he will require considerable information from operators of fleets of 20 or more trucks or buses and he urged all such operators to furnish his office immediately with the answers to the following questions:

1. Name of your operation and its headquarters.
2. Number of eligible vehicles:
 - a. In active operation;
 - b. Use made of each such vehicle;
 - c. Where each such vehicle is registered.
3. Location of one or more local rationing boards with which you prefer to file applications for emergency certificates. (If a fleet operator prefers to make all applications to a local board nearest his headquarters, this should be so stated. If the use of several boards is planned, the location of each should be given. It is desirable that operators choose boards which have inspectors available nearby to inspect tires declared to be unfit for further use.)
4. What is your average monthly requirement of tires and tubes for eligible vehicles from each local board?
5. State the number of new and usable tires and tubes not now on "running" wheels, but in your possession. (Note—this answer should state *all* tires and tubes, including spares, whether mounted or not.)
6. State the number of retreaded and recapped tires not now on running wheels, but in possession of the operator. This answer also must list all retreads and recaps, including spares, whether mounted or not.
7. How many *ineligible* vehicles are in your fleet?
 - a. In active operation;
 - b. Not in active operation.
8. Estimate the approximate date on

which new tires and tubes will be required for your eligible vehicles.

The quicker the answers to the foregoing questions are received, the quicker we will be able to arrange for the issuance of the emergency certificates, Mr. Henderson told the SAE Journal. Answers should be addressed to the Rubber and Rubber Products Section, Office of Price Administration, 6th St. and Independence Ave., Washington.

Speeds Tool Production

WITH this year's machine-tool requirements for war production set by WPB at something like \$2 billion, and the mid-February rate at around \$1.1 billion, Director W. H. Harrison of the Production Division is looking to the automotive industry to fill in part of the wide gap to get enough new and retooled machinery to meet the nation's armament program.

This skyrocketed demand represents a jump of 65 to 1, as compared with the depression low of 1932, and a jump of nearly 200% from the stupendous \$840 million of manufacturing machinery manufactured last year.

How it will be achieved:

- Through more intensive subcontracting of machine-tool parts, many in shops that have never done this type of work before;
- By intensive retooling of present equipment not needed for war production;
- By pooling of unused machinery, in programs such as the War Council for Automotive Production of the automobile industry;
- By every possible ingenious method to make one machine do the job of two or more.

Most critical machines, according to Ernest C. Kanzler, chief, Automotive Branch of WPB are:

- Horizontal borers,
- Jig borers,
- Vertical borers,
- Hobbers,
- Deep hole drillers,
- Radial drillers,
- Turret lathes,
- Gear grinders,
- Internal grinders,
- Thread millers,
- Engine lathes over 24 in.,
- Millers and planers over 36 in.,
- Profilers,
- Broachers,
- Thread grinders.

Mr. Harrison expects that other industry-wide surveys of available machinery will follow the pattern set by the ACWP and Mr. Kanzler.

His program, already underway, includes:

- Discussion of specific production problems with virtually every machine-tool manufacturer in the country. These will also include the larger tool rooms in the textile, woodworking, and other industries.

- Searching out new potential subcontracts of tool parts and elements.

- Simplification of sizes and designs, with view of upping tool output.

- Better planning and more effective use of tools available.

Conversion of the typewriter, refrigerator, business machine, washing machine and other metal-working industries are already under way.

Study Made For Allocation

HISTORY'S most detailed study of the U. S. metals industries is being made by WPB and the Census Bureau in a joint effort to govern the nation's distribution of scarce materials.

More than 10,000 questionnaires mailed Feb. 7 to manufacturers is to be the basis of the statistical analysis. Thousands of returns are now being tabulated by the bureau. The PD-275 form, an adaptation of the PD-25a, seeks to disclose:

- Total quantity of various materials used during the last quarter of 1941;
- Total inventory on hand Dec. 30, 1941, by types and sizes;
- Quantity of materials expected to be used during April, May, and June—either from purchases or inventories;
- Dollar values of shipments and sales during final quarter, 1941;
- Detailed breakdown as to types of manufactured items to determine the physical structure of materials.

Allocations of materials, both for manufacture of armaments and civilian goods, will be based on the study. Unless the study, when completed, will be considered a military secret, the conclusions will be released to the SAE Journal.



Gages Becoming More Scarce

PRODUCTION officials at WPB have discovered that gages are one of the most serious problems in meeting the nation's armament quotas. Reason No. 1:

During peacetime, the gage manufacturers could easily keep pace with demands, but accelerated manufacturing of metal products for war needs has found suppliers unable to meet the demand because:

- Far more gages are needed on most military products than on peace items;
- Every new part needs one or more new gages for adequate inspection;
- Many more inspections are required, wearing down gage surfaces faster;
- Many subcontractors must be supplied with gages.

As a result, a number of toolmakers have set up their own gage making shops in factory space—and sometimes in their own homes. Tool rooms of large automotive plants are working on mass production of the more standard types. Well equipped machine shops are becoming gage factories.

But the supply is low, and gages are becoming increasingly hard to get.

In the meantime, the National Bureau of Standards is putting gage calibration on a mass production schedule. The Bureau's equipment and experience in this field are well known.

Some precision gages require accuracy to .00001 in. The Bureau's new ruling machine graduates meter bars in terms of light waves. Some diamond cutters must be sharpened to 0.00001 in.

Ambulances Authorized

Because Cadillac Motor Car Division, General Motors, had enough parts to complete 719 special ambulance chassis, and the need for additional equipment appeared imminent in coastal cities, WPB permitted completion of these vehicles. The bodies will be distributed equitably to body builders.



Huge Scrap Drive Is On

FOLLOWING months of planning and several "local test experiments," the oft-discussed policy of putting junked cars and trucks back into new steel is getting under way. Auto graveyards are expected to be cleaned up in a national program within three or four months.

C. B. G. Murphy, who has had experience for several months as organizer of state and local salvage efforts, is in charge. He estimates:

- Between 4 and 5 million old jalopies are in the numerous auto graveyards in the U. S. These will produce:
- More than 3½ million tons of scrap, will help make:
- About 8 to 10 million tons of new steel.

Additional drives to get scrap collected and shipped to steel mills are under way. Chief sources:

- New industrial scrap;
- Old rails;
- Obsolete and broken machinery;
- Farm and home scrap metals.

Scrap tonnage will be allocated to steel mills by the Iron & Steel Branch, WPB.

Teeth were put into the effort by a joint statement of Lessing J. Rosenwald, chief, Bureau of Industrial Conservation, and Leon Henderson, OPA Administrator. "Fair prices" will be made to junk dealers and graveyard operators. If refused, entire yards and equipment will be requisitioned by the government, the statement said.

Aluminum Segregation Plan

SEGREGATION of all grades of aluminum alloy scrap generated by plants is vital to the war production program, the Aluminum and Magnesium Branch, WPB, explained in issuing Order M-1-d (Feb. 11) which requires segregation. It provides:

- No interference with normal functions of the scrap dealer;
- Proper segregation in the plant generating the scrap;
- Cooperation of all dealers is sought to maintain proper segregation while the aluminum is in their hands;
- Segregation of aluminum.



Study Spare Tire Plan

The seriousness of the rubber situation is indicated by WPB experts who have been studying plans to requisition motorists' spare tires to keep several million essential vehicles running.

WPB Field Offices Merged By Nelson

PRIORITIES, contract distribution, and other field offices—numbering more than 200—have been merged by WPB Chairman Donald M. Nelson under a consolidated Bureau of Field Operations under L. Edward Scriven, formerly in charge of priorities field offices. He will report to J. S. Knowlson, director of the Division of Field Operations.

Mr. Knowlson told the SAE Journal that the rapid expansion of field offices throughout the country since the inception of OPM had made it necessary to have all such activities handled through a single administrative channel.

Objectives:

- To give potential arms manufacturers faster service;
- To preclude at the source delays caused by lack of clearance of problems with other WPB agencies involved;
- To set up a framework for further expanding field office facilities.

Walter H. Wheeler, who was deputy director of the Contract Distribution Division remains in Washington to administer this function. He will operate in the field through the new bureau, and reports to W. H. Harrison, director, Production Division, at the Washington end.



Auto Branch Adds to Staff

JOHN E. GRAHAM has been appointed assistant chief, Automotive Branch, Division of Industry Operations, Ernest C. Kanzler, chief, announced. Mr. Graham will serve with R. L. Vaniman, deputy chief, in the Washington office to keep a liaison with the Detroit headquarters of the Branch.

Irving J. Reuter, former president, Buick Motor Co., was appointed assistant to Mr. Kanzler. He has been associated with Remy Electric Co., Olds Motor Works, and Opel Motor Works, Germany.

G. F. Dowling, for many years in the automobile business in Belgium, was appointed acting chief of the Medium and Heavy Truck Section.

Fred B. Lautzenhiser, as announced in last month's SAE Journal, has been serving as a technical expert in the Branch. He has been named technical consultant on trucks.

Charles S. Doerr was named chief of the Military & Export Requirements Section, and has had experience with the Motor Transport Division, QMC.

Gardner S. Platt, veteran of World War I and with the Washington office of Packard Motor Car Co., has been named acting chief of the Passenger Car & Light Truck Section of the Branch.



Corundum Is Allocated

Corundum, a fine abrasive, widely used by the automotive industry in wheels, flats, and powder, was put under full allocations by Order M-89, Feb. 10. Most of the U. S. supplies come from South Africa, and are chiefly used for lens grinding.

Arms Contracts Are Speedier

(Continued from page 21)

where costs can be reduced, or production speeded up, or both—as in the case of any mass production project.

A Contract Review Branch in WPB will undertake to handle this phase of the procurement speedup, Donald M. Nelson, WPB chairman, told the SAE Journal.

Often, to get production of a given item increased, it will be necessary to pay one company more than another for similar products. This new policy of orderly reviewing of contracts will disclose why, and will permit more intelligent decisions, Mr. MacKeachie said.



Troubleshooting Arms Output

DAILY progress reports to top WPB executives is the new troubleshooting device adopted by the armament effort. Some 300 arms items will be covered by the reports under the system devised by Stacy May, top WPB statistician and head of the new Progress Reporting Division. It is a standard practice used in automotive plants to keep production running smoothly.

Should M-3 tanks be coming along too slowly, the head of this procurement will ask for daily breakdowns, including:

Reports of the status of principal component parts, showing progress of:

- Hulls,
- Engines,
- Transmissions,
- Guns,
- Other component units.

Thus will be revealed the relative progress in manufacture of components.

Should the delays appear to be caused by transmissions, the chief will ask for a further breakdown of transmission output, which will include the status of these components in the shops of each manufacturer.

Detailed breakdowns will be provided only upon request, by the new division, and will have daily reports from the field in order to produce reports within a few hours.



Farm Machinery Gets Repair Aid

PRIORITY assistance for the repair and maintenance of agricultural machinery in the hands of farmers has been made available by an amendment to the Repair and Maintenance Order (P-100, Feb. 10), issued by the Division of Industry Operations, WPB.

A farmer who repairs his machines himself, or his repair man, may now use an A-10 rating on his orders for necessary materials, from nuts and bolts to major repair parts.

The rating may not be used, however, to obtain or replace items of capital equipment. There is no guarantee that the A-10 rating will be sufficient to secure delivery of all types of repair supplies, however.

Victory-Grams



WATCH NEWSPAPERS FOR:
NEW ALUMINUM ORDER;
TRUCK RATION PLAN, WHICH
WILL BE SUBJECT TO FURTHER
AMENDMENTS;
ORDERS ON SCRAP METALS;
HUGE NEW ARMS CONTRACTS.



WAR WILL DULL THE HUES OF
AUTO LICENSE PAINTS, WHICH
WILL BE LIMITED TO DOMESTIC
PIGMENTS. COBALT BLUE AND
CHROME YELLOW ARE OUT,
WPB SAYS.



TIN CANS WILL BE USED TO
LEACH OUT OR LIXIVATE COP-
PER FROM MINE WATER IN NEW
WPB METALS PROGRAM. PROC-
ESS IS AN ANCIENT ART RE-
VIVED BY WAR, HAD NO ECO-
NOMIC VALUE IN DAYS OF
PEACE. LOCATIONS ARE UN-
DISCLOSED MILITARY SECRETS.



MANY CURTAILMENTS OF CIV-
ILIAN PRODUCTS HEREAFTER
WILL BE ORDERED IN THE INTER-
EST OF MAKING THAT MANY
MORE MACHINE TOOLS AVAIL-
ABLE FOR ARMAMENT PRODUC-
TION, OTHERS AS FINAL STEP
TO SAVE SCARCE MATERIALS,
SOME FOR BOTH PURPOSES.



Tin Smelter Is Speeded

A tin smelter, now under construction in Texas, has been redesigned to produce 52,000 tons a year from the original 18,000-ton capacity, was given an A-1-a rating by WPB to speed its completion. It will use Bolivian concentrates.

Most of the tin used in the U. S. has been smelted abroad. Consumption was 88,000 tons in peacetime 1939, about 12% going into the automotive industry that year.



Rationing Programs Based on War Needs

(Continued from page 20)

Estimated supplies of rubber were developed by the Rubber Branch, Division of Industry Operations, and its OPM predecessor. Arthur Newhall, formerly deputy director, Division of Purchases, heads the Rubber Branch, and is chairman of the Rubber Allocations Committee on which are representatives of the Army, Navy, Lend-Lease, Board of Economic Warfare, and other defense agencies.

Here the war needs, in terms of tons of

crude rubber, were subtracted from the total estimated U. S. Supply (S). Here the residue was allocated to various tentative uses by:

Donald R. Longman, allocations specialist of the Division of Civilian Supply, WPB, who is also a member of the Rubber Allocations Committee. His organization had already determined the relative needs of rubber in other-than-war manufacture. He had already conferred with the OPA in respect to prices, handled by Ben Lewis, and tire rationing which is under Grenville Holden.

Industry Advises

Industry was called in to advise the Rubber Branch as to the percentages required for essential civilian use. *These recommendations were revised downward as the military needs increased.* The residue was then allocated percentage-wise to tires (A), mechanical goods, footwear, clothing, wire insulation, etc. Parenthetically, whereas footwear and clothing uses of rubber were far ahead of that for insulation in peacetimes, the opposite is now true in view of the needs of wartime.

This study required careful quantitative analysis "from both ends to the middle," i.e., the relative necessities on the one hand being weighed with the successively smaller estimates of amounts available.

Under the WPB set-up, the Division of Civilian Supply issues no orders. But its recommendations, when approved, are administered by the:

Division of Industry Operations, WPB. Rubber is handled by the Division's Rubber Branch, which allocated specific amounts of crude rubber to companies in the rubber industry. Studies developed by the Automotive Branch, headed by E. C. Kanzler, were taken into account inasmuch as the automotive industry used about 82% of the total U. S. supply during peacetimes. The Transportation & Farm Equipment Branch was also consulted as representing a large user group. Besides the representatives of rubber manufacturers who were members of the Rubber Branch, such groups as the:

SAE Group Aids

SAE War Engineering Board, headed by James C. Zeder, chief engineer of Chrysler Corp., were consulted. This group has submitted a study on the use of rubber in automobile replacement parts, and possible substitutions, to the WPB.

Problems that involved labor dislocations because of the restrictions put on the use of rubber were referred to the:

Labor Division, WPB, and through its engineering section to the:

Subcontracting Section, Production Division, WPB, to aid in getting war work into plants which have no rubber for non-defense manufacture.

The final proposal was then referred to attorneys by the Rubber Branch for drafting the order, which was signed by WPB Chairman Donald M. Nelson. These supplementary orders then became the law.

The country's rubber resources are controlled by the Rubber Reserve Co., a subsidiary of the Reconstruction Finance Corp. Rubber manufacturers get their respective allocations from the Rubber Branch, WPB, and this permits them to buy rubber as needed from the Rubber Reserve Co.

The final step is taken by the ultimate consumer, who must show his local Tire Rationing Board specifically why he needs tires. His needs are weighed against those of his neighbor (who together make up A) and what he gets is x—if any.

About SAE Members

L. C. GOAD recently was placed in charge of the newly-created Eastern Aircraft Division of General Motors Corp., which will manufacture fighting planes for the Navy. Mr. Goad has been assistant to Albert Bradley, vice president of GM, and was previously general manager of the AC Spark Plug Division in Flint, Mich.

GEORGE M. WILLIAMS, president, Russell Mfg. Co., has been granted indefinite leave of absence to become first assistant to the chairman of the Vultee-Consolidated



George M. Williams

Aircraft Corp. Mr. Williams will not sever connections with the brake lining industry, but will merely be loaned to Vultee-Consolidated for the duration.

ALEX TAUB recently joined the staff of the Economic Warfare Board which has been established to study the resources of the western hemisphere and to formulate plans to strengthen the Allies' war program. Mr. Taub formerly was designated a special assistant to Sidney Hillman, OPM co-director, to serve as liaison with Floyd Oillum's Division of Contract Distribution.

SHERMAN M. FAIRCHILD recently donated \$25,000 to the Institute of the Aeronautical Sciences for publication and distribution of scientific data which are essential and valuable but may be too specialized in character for the government to print. Mr. Fairchild is chairman, Fairchild Engine & Airplane Corp., New York. A part of the fund will be at the disposal of the U. S. Air Force. In normal times, the fund will be used to make available to the aeronautical profession technical reports which are too limited in general interest to be published in trade publications.

ARCHIBALD M. HALL, formerly assistant to the manager, Consolidated Aircraft Corp., San Diego, Calif., has been transferred and made division manager, Fort

Worth Division of Consolidated, Fort Worth, Tex.

HARVEY W. HANNERS now is employed as development engineer, Superior Engine Division, The National Supply Co., Springfield, Ohio. Formerly he was experimental engineer, diesel engines, Fairbanks, Morse & Co., Beloit, Wis.

Elected vice chairmen of the Business Advisory Council of the Commerce Department recently under R. R. Deupree, were: **RALPH E. FLANDERS**, president, Jones & Lamson Machine Co., Springfield, Vt., and **PAUL G. HOFFMAN**, president, Studebaker Corp., South Bend. The council is a voluntary committee of some 60 prominent business and financial leaders, who help the government get cooperation from business. They serve without pay and give the President confidential reports on business reaction to governmental problems.

ROY W. JOHNSON, for the past 10 years general manager, Corcoran-Brown Lamp Division, Electric Auto-Lite Co., Cincinnati, has been appointed general manager of the Boots Aircraft Nut Corp. He will be located at New Canaan, Conn.,

Named General Manager



Roy W. Johnson

where the Boots company has recently established a research laboratory for the development of new products to fit specific applications incorporating the self-locking principle.

A. L. FREEDLANDER, president and general manager, Dayton Rubber Mfg. Co., was recently appointed deputy chief, Rubber and Rubber Products Branch, Division of Industry Operations, War Production Board.

LAWRENCE LEAS now is working in the Van Nuys, Calif., engineering department of the Vega Aircraft Corp., doing layout work with the power plant group. Formerly, he was aircraft-engine test inspector, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

S. B. BARNARD, formerly president, Barnard Aviation Equipment Co., Inc., Ashley, Pa., recently joined All-American Aviation, Wilmington, Del.



Don R. Berlin

DON R. BERLIN, who designed the Curtiss P-40 pursuit plane, has joined General Motors Corp. as aeronautical engineer on the staff of **O. E. HUNT**, vice president of the corporation. Mr. Berlin formerly was director of military engineering of the airplane division, Curtiss-Wright Corp., Buffalo, N. Y. He will assist Mr. Hunt in connection with expanded aviation activities of General Motors, and will be headquartered in Detroit.

WILLIAM W. MANVILLE has been named research engineer in charge of laboratory, Aircooled Motors Corp., Syracuse, N. Y. Formerly he was research engineer, Standard Oil Development Co., Elizabeth, N. J.

C. N. PAXTON, associate professor in mechanical engineering, College of Engineering, University of Oklahoma, recently was granted leave of absence to take a post in the Bureau of Aeronautics, Navy Department, Washington, D. C.

RAYMOND J. SCHNELLER, formerly junior engineer, Construction Division, E. I. du Pont de Nemours & Co., Wilmington, Del., is now assistant transportation officer, Motor Company, Engineers Replacement Training Center, Fort Belvoir, Va.



Eddie Molloy

EDDIE MOLLOY, works manager, Ryan Aeronautical Co., San Diego, Calif., has been elected vice president in charge of manufacturing.

Made War Committee Chairman



Julian J. Frey

JULIAN J. FREY has been named chairman of a newly formed War Committee of the Ethyl Gasoline Corp. Included on this committee are SAE members **EARL BARTHOLOMEW**, **DR. GEORGE CALINGAERT**, **DR. GRAHAM EDGAR**, and **S. D. HERON**. Function of the War Committee is "to adapt Ethyl Gasoline Corp. research facilities to the needs of the armed forces."

Mr. Frey, formerly head of Ethyl's technical sales division, also has been made director of the corporation's new Technical Service Department, embracing the following divisions (each headed by an SAE member): Bus and Truck, **ERROL J. GAY**; Gasoline Testing, **JOHN CLIFFORD POPE**; Refinery Technology, **WILLIAM H. HUBNER**; Agricultural, **C. G. KRIEGER**. A fifth and newly formed Passenger Car and Automotive Accessories division is headed by Richard K. Scales.

HENRY H. HOWARD, manager of the Engine Sales Division, Caterpillar Tractor Co., Peoria, Ill., has been loaned to the Ord-

Appointed Ordnance Consultant



Henry H. Howard

nance Dept., U. S. Army, to serve as consultant to **COL. J. K. CHRISTMAS** of the Tank and Combat Vehicle Division. Mr. Howard's position at Caterpillar will not be considered vacated, but his duties and responsibilities will be assigned for the period of his absence to **HORATIO W. SMITH**, assistant manager of the Division.

Two SAE members recently gave radio talks on the automotive industry and its part in the war effort. They were: **CHARLES E. WILSON**, president, General Motors Corp., who was interviewed on the coast-to-coast program "Your Defense Reporter," Thursday evening, Jan. 22, on the

subject of "The Automobile Industry in War Production"; and **ROBERT F. BLACK**, president, The White Motor Co., who spoke on "War and Motor Transportation" on the "Farm and Home Hour," Saturday noon, Jan. 17.

EDGAR J. DOUGLAS, formerly detail draftsman, Hudson Motor Car Co., Detroit, now is electrical layout draftsman, The Austin Co., Cleveland, Ohio. The company does construction and engineering work.

JOHN W. VOTYPKA recently was named vice president and director of production engineering, Fruehauf Trailer Co., Detroit, and **F. M. REID** was named vice president and director of experimental and research engineering. Mr. Votypka formerly was chief engineer and Mr. Reid was research engineer of the Fruehauf organization.

G. Waive
Thomas
Joins
Continental



G. WAINE THOMAS recently severed connections with the Mack Mfg. Corp., Allentown, Pa., as engineer in charge of light trucks, to become project engineer, Aircraft Division, Continental Motors Corp., Detroit.

R. KAREY, who has been an engineer, Wico Electric Co., West Springfield, Mass., has joined the Aircraft Propeller Department, Bartlett Hayward Division, Koppers Co., Baltimore, as project engineer.

JOHN J. DRANEY, secretary-treasurer, SAE Kansas City Section and formerly layout and detail draftsman with the Witte Engine Works, has a position with Consolidated Aircraft Corp. in San Diego, Calif. **HOWARD DOUGHERTY** will replace him as Kansas City Section secretary-treasurer.

L. H. GRISSELL, who collaborated with **GAR WOOD** in designing experimental engines for the famous "Miss America" series,

Named Kermath Chief Engineer



L. H. Grisell

and who, more recently, has been chief engineer, Scripps Motor Co., Detroit, now is chief engineer of Kermath Mfg. Co., Detroit.



Frederick M. Thomas

FREDERICK M. THOMAS now is in the Aircraft Branch, Production Division, War Production Board, Washington, D. C., as a specialist responsible for coordinating all matters pertaining to engineering research, production, and allocation of aircraft engines. Formerly Mr. Thomas was an aeronautical engineer, Bristol Airplane Co., Ltd., Bristol, England.

M. C. SOVEREL, formerly standardization engineer, Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., now is employed by the Wright Aeronautical Corp., Paterson, N. J.

DAVID S. WEBBER is now working as a mechanic and tune-up operator at Carroll's Jenny Service, Chestnut Hill, Mass.



Scragg
On War
and
Distribution

"If we in America learn to eliminate product distribution waste from our daily business activities, the taxes that the government is going to impose upon us to pay the costs of war, can easily be taken care of. In fact they can well be paid by the saving we make, and we will have money left over as a dividend for ourselves."

Speaking before the Women's Advertising Club of Cleveland, Jan. 13, **GEORGE H. SCRAGG**, director of advertising and sales promotion, White Motor Co., said further that 58% of the consumer dollar goes into distribution. The war will teach us lasting lessons in the art of economically getting the goods to the customer, he said. Pooling of delivery trucks, and fewer but more profitable route trips were two of the means Mr. Scragg outlined by which this economy can be brought about.

HARMON S. EBERHARD, chief engineer, Caterpillar Tractor Co., Peoria, Ill., was recently named vice president of the company, and **C. G. A. ROSEN**, formerly



Harmon S. Eberhard



C. G. A. Rosen

assistant chief in charge of Caterpillar's diesel research, has been appointed head of a newly-created research department.

EDWARD CHARLES McNEELY, who was tool and gage engineer, Merz Engineering Co., Indianapolis, Ind., has joined the Acme Pattern & Tool Co., Dayton, Ohio, as tool engineer.

Takes Chief Metallurgist Post



L. C. Conradi

L. C. CONRADI has been named chief metallurgist, Standard Steel Spring Co., Coraopolis, Pa. Formerly he was technical

research director, International Business Machines Corp., Endicott, N. Y.

CORNELIUS M. O'DONOHUE recently was appointed as senior industrial specialist, Contract Distribution Branch, Production Division, War Production Board, Washington, D. C. Formerly he was tool engineer, Vega Aircraft Corp., Burbank, Calif.

PAUL C. ROCHE now is a field engineer, Lord Mfg. Co., Erie, Pa. Formerly he was a sales engineer with the same company.

T. L. PREBLE, supervisor, automotive transportation, Tide Water Associated Oil Co., New York, and **GAVIN W. LAURIE**, manager, automotive transportation department, Atlantic Refining Co., Philadelphia, have been appointed technical consultants to the Office of Defense Transportation. Their assignment is with the Motor Transport Division, headed by ICC Commissioner John L. Rogers. Both have served as vice presidents of the Society for the Transportation & Maintenance Activity, and Mr. Preble was chairman of the Metropolitan Section.

In Military Services

LT.-COL. B. J. LEMON now is in the Planning Branch, Quartermaster Corps, in Washington, D. C. Formerly he was secretary, War Products Committee, U. S. Rubber Co., N. Y. Col. Lemon saw service in the Motor Transport Corps, U. S. Army in 1917. He was made a Lieutenant-Colonel in the Quartermaster reserves in 1932.

MAJOR H. G. CONN recently left Canada for active service overseas. He is now commanding officer, 3rd Division Ordnance Workshop, Royal Canadian Ordnance Corps, in England. Formerly he was a lecturer on internal combustion engines, Department of Mechanical Engineering, Queen's University, Ontario.

LT. (JG) C. R. JOHNSON recently was transferred from Massachusetts Institute of Technology, Cambridge, Mass., where he was instructor, Aviation Special Service for the U. S. Navy, to the Bureau of Aeronautics, Washington, D. C. He continues with the Aviation Special Service.

LT.-COM. GEORGE J. HIGGINS, USNR, has been granted leave of absence from the University of Detroit faculty to teach aeronautical engineering in the U. S. Naval Academy's post graduate school. For five years before joining U. of D.'s faculty, Com. Higgins was on the National Advisory Committee for Aeronautics, Langley Field, Va.

CLYDE H. MITCHELL recently was advanced from Captain to Major, U. S. Air Corps. He is a representative for the Air Corps at the Curtiss-Wright plant in Buffalo.

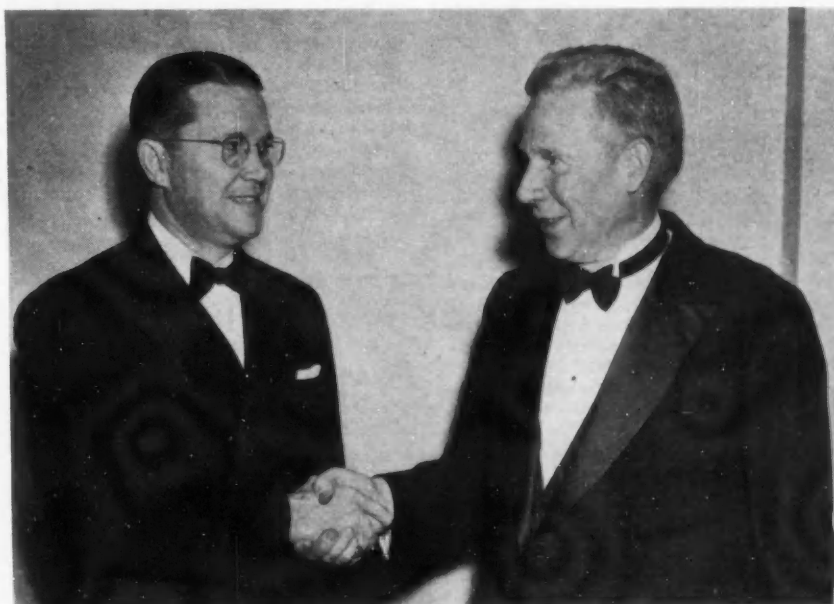
MYRON S. HUCKLE now is a First Lieutenant in the Air Service Command, U. S. Army Air Force, at Sheppard Field, Wichita Falls, Tex., where air mechanics are being trained. Prior to service in the air arm, Lt. Huckle was president, U. S. Diesel Corp., Boston.

PHILIP B. ROCKWOOD has left Cleveland Railway Co., Cleveland, where he was a mechanical engineer, to go into active service with the U. S. Army in the 1st Provisional Ordnance Training Company at Aberdeen, Md.

HAROLD W. CLOUD has been ordered into the U. S. Army at Fort Bragg, N. C., to take up duties from his reserve commission as First Lieutenant in field artillery. He leaves Sealed Power Corp., Muskegon, Mich., where he was manufacturing planning engineer.

MAJOR WALTER HOYT KENNETT is now with the 2nd Battalion, 55th Quartermaster Regiment, U. S. Army, at Fort Lewis, Wash. Formerly he was stationed at Fort Sill, Okla.

(About SAE Members continued on page 34)



Presidents, present and past, of the Institute of Aeronautical Sciences shake hands. **HALL L. HIBBARD**, vice president and chief engineer, Lockheed Aircraft Corp., titular head of the Institute for 1942, is congratulated by retiring president **FRANK W. CALDWELL**, director of research, United Aircraft Corp.



Synthetic Rubber Wartime Output Greatly Accelerated, Smith Reports

■ **Metropolitan**

RAPID wartime strides will be made in the manufacture of synthetic rubber in the United States, and improvements far beyond existing standards may be expected, K. D. Smith, assistant to the vice president in charge of production, B. F. Goodrich Co., told the Metropolitan Section at its regular meeting on Jan. 22.

Thousands of tires made of synthetic rubber have been in service for more than a year, Mr. Smith said, and service and maintenance reports from more than 200 fleets using these tires show that the synthetic materials are equaling the performance of natural rubber casings.

However, users must face the fact that efforts to conserve tires must be doubled and redoubled, because of the hazards of importing rubber from the Pacific war zone and because all of the synthetic rubber production in sight will be requisitioned by the military authorities for winning the war. A modern battleship requires 75 tons of rubber and approximately one ton is used in the production of a medium tank, Mr. Smith said.

Examination of tires removed from recently captured German aircraft shows clearly that the Axis synthetic product is of very low quality. The Germans, he said, are running low on carbon black, age-resistors, and organic accelerators which were first developed by American researchers to improve the quality and prolong the service life of rubber and synthetic rubber products.

Mr. Smith was optimistic about the future of synthetic developments, indicating that a vast amount of research work is being done by a number of companies. Furthermore, considerable research is currently being done with various types of plants indigenous to the United States and this continent, he said.

R. L. Biggers, Chrysler Corp., discussed the rapid strides being made by the automotive industry in retooling for arms manufacture. He paid high tribute to the Army for reorganizing its motor corps facilities and handling its vast fleet of trucks. He commended the automotive industry's machine-tool "pool," making available machinery to other manufacturers with war contracts. The

joint project of White Motor Co., Autocar Co., and Diamond T Motor Car Co., in building a standard vehicle for the Army was an example, he said, of many other co-operative efforts to build war equipment rapidly.

He cited increases far beyond original production estimates of aircraft, aircraft engines, accessories and parts, tanks, guns, and munitions now being manufactured by automotive companies. Many plants have been wholly retooled from peacetime product manufacture to arms, although none of these factories had ever built the products they are now manufacturing with the same automobile production machines which they have used for making automobiles and parts.

Mr. Biggers showed a moving picture, "Assembly Lines of Defense," on the production of tanks in the Chrysler tank arsenal. This, he said, was only one of many examples of "miracles of armament manufacture" which will soon be an industrial commonplace in the United States.

Vice Chairman Herbert Happersberg opened the meeting, and J. F. Winchester, the Section's Meetings chairman, introduced the speakers. Arrangements for the session were made by Herbert Chase, vice chairman.

Now It's WAR!

SAE WAR ACTIVITY COUNCIL was approved by the SAE Council at its Feb. 14 meeting as the name of the group previously known as the SAE National Defense Committee, since its formation in June, 1940. B. B. Bachman continues as chairman. The War Activity Council is charged with supervision and coordination of all SAE war effort.

SAE JOURNAL FIELD EDITORS

Baltimore—J. F. Rowley

Buffalo—F. L. Koethen

Canadian—Warren B. Hastings

Chicago—Austin W. Stromberg

Cleveland—R. S. Huxtable

Dayton—T. B. Holliday

Detroit—W. F. Sherman

Indiana—Harlow Hyde

Kansas City—Howard F. Dougherty

Metropolitan—Charles F. Foell

Milwaukee—L. L. Bower

New England—James T. Sullivan

No. California—Trescott S. White

Northwest—Lee Ketchum

Oregon—Z. C. R. Hansen

Philadelphia—T. B. Hetzel

Pittsburgh—Murray Fahnestock

St. Louis—Roy T. Adolphson

So. California—Harold W. Ager, Jr.

So. New England—J. A. Clark

Syracuse—No Appointment

Tulsa Group—W. F. Lowe

Washington—G. B. Lacy

Subcontracting Work Sustains English Car Dealers

■ **Canadian**

WHEN automobile production stopped in England and dealers were threatened with bankruptcy, they crowded a lathe, drill or punch press into the garage or store-room and took subcontracts for small parts needed in plane, tank, and munitions manufacture. In this way they have been able to keep their organizations running.

K. E. Barton, Goodyear Mechanical Rubber Division, in his talk before 137 members and guests of the Canadian Section on Jan. 21, in Toronto, said, however, that such methods might not work if applied to the American scene. Mr. Barton's topic was "Industrial England Under War Conditions."

Praising the great part motor transport played in England's dark period of August, 1940, to May, 1941, Mr. Barton said: "It is not too much to say that motor transport saved the situation: at least for industry." The flexibility of the truck which could change its route as necessity compelled, the readiness of the operators and men to give herculean efforts in time of crisis, gradually brought some order out of the chaos which for a time prevailed around the principal parts, Mr. Barton stated.

The author logged the stormy course of the British automotive industry from the start of the war to the present.

"Soon after the outbreak of war, the manufacture of new cars was stopped," he said. "My information is that last year 400 passenger cars were built for government

requirements. Truck operation was, of course, pushed to its limits. This soon engaged the greater part of the motor car factory space. Strict limitation of spare part manufacture added to the car owner's difficulties.

"But that was only part of the car driver's and the dealer's problems," Mr. Barton continued, "for the real method of car operation came through petrol restriction. As previously stated, the average car which is about half the size of a Chevrolet, has a 10 or 12 hp motor. The basic gasoline ration was 6 gal per month, representing about 200 miles of driving. To this would be added supplementary allowance, if any. The result was that one third of the cars in the country were laid up and those which were licensed averaged far less than one half of their normal mileage.

"It is not difficult to estimate the effect on the dealer. He was on the spot. Actually, the manufacture of cars and accessories, including tires, needed no sympathy, for government orders and new products kept up their volume. But not for the dealer. Nevertheless, my observation was that most of them, certainly the well-managed, have continued in business.

"The first action, of course, was to cut overheads," Mr. Barton reported. "You who know how poorly the English garage and service station compares with ours would wonder what they could cut off. One retrenchment was in outside sales effort. There was, of course, a prompt tendency to eliminate all price cutting and to maintain full list price. Old cars meant more service, as well." It was at this point that subcontracting for the military came in, Mr. Barton said.

Giving sidelights on business as it is being conducted in England during the war, the speaker discredited the statement that any manufacturing areas have been "leveled" in England. "It is with great satisfaction that I tell you industry has relatively been little damaged and carries steadily on," he concluded.

Before Mr. Barton delivered his talk R. M. Thomas, general manager of the host company, Perfect Circle Co., Ltd., and Charles Tilston, past chairman of the Section and chairman of the Membership Committee, at the request of Chairman R. W. Richards, gave graphic synoptic reports of the Society's Annual Meeting in Detroit.

SAE Load-Dimension Code Revised for 1942 Handbook

EIGHT months of intensive work in re-drafting the SAE Standard Load and Dimension Limitations on Motor Vehicles (p. 737, 1941 Handbook) has resulted in: Setting maximum height for all units at 13½ ft (previously it was 12½ ft);

Establishing the length of single unit at 35 ft; tractor-semi-trailers 45 ft; and all other combinations 65 ft;

Specifying that gross weight shall be in terms of gross weight carried per axle only.

The code was originally developed by the Automotive Transport Code Committee of the SAE in June, 1933, "for the purpose of arriving at the bottom limit of restrictions which can be supported on a strictly engineering basis." The purpose of the present revised standard remains the same—to form a foundation for the study and arbitration of restrictive legislation and regulation.

Scheduled for publication in the 1942 Handbook—the revised code will be presented with "reasons for" material directly following each revision. In the 1941 issue the two were presented separately. It is hoped this new treatment will improve readability.

The new standard revision was made by a subdivision of the Transportation Division. The personnel includes: F. K. Glynn, Chairman, American Telephone & Telegraph Co.; E. W. Allen, Yellow Truck & Coach Mfg. Co.; B. B. Bachman, Autocar Co.; L. R. Buckendale, Timken-Detroit Axle Co.; Robert Clark, Consolidated Edison Co. of N. Y.; F. L. Faulkner, Armour & Co.; M. C. Horine, Mack Mfg. Corp.; Leo Huff, Pure Oil Co.; C. W. Kynoch, Chrysler Corp.; F. B. Lautzenhiser, International Harvester Co.; C. G. Morgan, Jr., American Trucking Associations, Inc.; T. L. Preble, Tide Water Associated Oil Co.; F. M. Reid, Fruehauf Trailer Co.; Dale Roeder, Ford Motor Co.; S. B. Shaw, Pacific Gas & Electric Co.; J. L. S. Snead, Jr., Consolidated Freightways, Inc.; A. T. Warner, National Association of Motor Bus Operators; R. Whitfield, Georgia Power Co.; J. F. Winchester, Standard Oil Co. of N. J.; R. B. Wuerfel, Chevrolet Central Office Division, GMC.

War Industry Job Training Reviewed by Prof. O'Brien

■ So. California

THE imperative need for technically-trained men for industry war work was brought forcefully home to 175 members and guests of the Southern California Section at the Feb. 13 meeting, held at the Hollywood Athletic Club.

Prof. M. P. O'Brien, of the University of California, gave statistics on the number of engineers required for the various branches of our armed forces which left no doubt in the minds of those present that many young engineers now employed in civilian work will be taken by the Government. The title of Prof. O'Brien's paper was: "Training Defense Industry Personnel."

In discussing means to satisfy the demands of industry for technically trained people, the three-year engineering course was covered. This program, however, will give just one extra class of graduate engineers, and many of these will have to receive financial assistance in order to carry out a full year—48 weeks per year school schedule, Prof. O'Brien said.

At the present time, many of the aircraft factories have training programs under way which are endeavoring to take people in their own plants and train them for routine drawing, and similar tasks, which will relieve trained engineers for more involved problems, the speaker stated. In connection with this company training, he said, the factories are endeavoring to use the defense training classes—specifically mathematics, mechanics, and stress analysis to augment their own schooling.

The aircraft plants are also endeavoring

to take the college graduates in their engineering departments and train them to design for production, Prof. O'Brien reported. That is, design to use all production equipment to advantage, and not have the bulk of all parts going to one or two production machines. The acquainting of shop and engineering personnel with each other's problems should greatly facilitate greater production volume, he said.

The possibility of using women in minor engineering work is being given a great deal of attention. The chief problems along this line are:

The extent of training;

Degree of a woman's engineering capacity; and

What the future after the war holds for women in this line of work.

At the present time, many of the aircraft plants are training women for drawing work, and they seem to prove very satisfactory.

For semi-skilled workmen, the defense training in vocational schools is providing a large number of satisfactory workmen, Prof. O'Brien stated. These people can take a short course in operating a lathe, welding, or various ship fitting jobs, which enables them to work in defense industries to great advantage.

Prof. O'Brien felt that one of the worst aspects, as far as industry obtaining college graduate engineers, is that the young man in his senior year at school does not know how employment will affect his standing in the selective service draft.

Therefore, with various branches of our armed forces, including the Navy, offering commissions to these men on graduation, the majority of them are accepting the Navy proposition. Industry cannot blame these men, as they are anxious to serve in the armed forces, and the availability of a commission makes it more inviting than ever, the speaker concluded.

Following Prof. O'Brien's paper, the chief topic was discussion about training women for industry, and making many of the young men now employed there available for military duty.

P. B. Robertson, assistant director of Industrial Relations, Vega Aircraft Corp., served as toastmaster and leader of discussion. Among the discussers were:

M. V. Mattson, assistant manager, Lockheed-Vega Aircraft Co.; Dean Robert E. Vivian, School of Engineering, University of Southern California; Malte Swensen, Douglas Aircraft Co., Inc.; Fred C. Patton, manager, Los Angeles Motor Coach Co.; Tom Faulkner, Consolidated Aircraft Co.; Dr. Bolden, Lockheed Aircraft Co.; J. Doug Wilson, Los Angeles Board of Education; Charles Sander, chief engineer, Kinner Motors, Inc.; Jack Kadushin, in charge of engineering education, Lockheed-Vega Aircraft Co.; M. E. Beaman, director of public relations, North American Aviation Corp.; and George Ford, supervisor of education, Vultee Aircraft, Inc.

Effect of All-Out War On Transportation Cited

■ No. California

"THIS is a mechanical war—an engineer's war—and undoubtedly all members of the SAE are now, or soon will be, taking active part," said Northern California Chairman Charles F. Becker in opening the January meeting, a forum on the effect of after-Pearl-Harbor developments upon the

DESIGN and RESEARCH

will be discussed in the light of changing war conditions at the SAE Aeronautic Meeting, March 12-13

(See page 33)

Jennings Appointed to SAE Staff To Direct Broad T&M Activities

HENRY JENNINGS, former technical editor of *Commercial Car Journal*, joined the SAE Headquarters staff on Feb. 2 as staff representative in contact with the Transportation and Maintenance Activity. The work of the T&M Activity group has been expanding rapidly in recent months and includes a program dealing with special public utility problems, maintenance control and research, fleet management problems, equipment and design factors, and special bus problems.

Implementing the development of these activities are 31 T&M subcommittees at work on various transportation and maintenance engineering problems, which now require the services of a full-time staff representative so that the results of the work may be made available for military as well as commercial operators as rapidly as possible.

Mr. Jennings has been affiliated with the Chilton Co. since 1929 and became technical editor of *Commercial Car Journal* in 1934. During the years that he worked with fleet operators, Mr. Jennings was a member of the SAE T&M Activity Committee and in 1940 he was its vice chairman. While engaged at *Commercial Car Journal* he was also chief instructor of the automotive course at Spring Garden Institute.

Prior to his affiliation with *Commercial Car Journal*, Mr. Jennings was assistant to the president of the Larrabee-Devo Motor Truck Co., Binghamton, New York, where he represented the president in engineering and maintenance matters. He went to



Henry Jennings

Larrabee from the Yellow Truck and Coach Mfg. Co., where he had been a maintenance engineer in the eastern district. As a representative of Yellow Coach, he set up a number of shops and developed maintenance routines and practices for a number of fleets.

Until Durant Motors closed its branches, Mr. Jennings was service manager of the New York Branch. He had held other technical positions in that organization. Mr. Jennings was educated at Fordham University.

automotive industry. Forum Chairman Sidney B. Shaw, Pacific Gas & Electric Co., divided the discussion into the following general groups: transportation, fuel, lubricants, car production, truck deliveries, substitute materials and personnel. Informal discussion was directed primarily toward the effect of each of the above items on individual members in their respective communities.

A transportation shortage is one of the most pressing of the immediate problems, especially in and around shipyards and other defense factory areas, it was brought out. With this in mind, large cities must quickly work out a plan to take care of a tremendous increase in passenger traffic over their existing inter-urban, street car and bus lines. Sixty thousand people a day travel by private car across the San Francisco-Oakland Bay Bridge, and when private cars are laid up for lack of rubber tires, existing facilities as now arranged simply will not be able to take care of them. The same situation appears in and around every business or industrial community, and the most promising suggestion for handling the extra traffic is to stagger business and office hours so as to broaden the heavy 9 to 1 peak loads and thus handle more people with the same equipment. Suggestions as to the possible use of trailer buses or trucks, trailers for street cars, and the return to water transportation wherever possible, all met the same objection—new equipment could not possibly be obtained in time and in addition, no private concern could justify the expense of

new equipment to meet a situation of possibly no more than a year or two's duration.

Stoppage of taxicab and parcel delivery services appears certain when present tires are gone, it was pointed out. Home delivery of milk, bread and similar services is already curtailed and may be discontinued altogether; however, plans whereby routes of competing companies are pooled to eliminate duplication may enable limited deliveries in certain instances. Jitney services may be organized to handle transportation of workers, and if established transportation companies cannot handle this business they must recognize the need for, and allow the establishment of, a reliable jitney bus system.

The fuel problem is not particularly acute at the present time, the engineering audience was told; however, there is already in progress a trend downward in octane number due to a possible shortage of tetraethyl lead and an increased demand for aviation fuel. Fleet operators will know enough to adjust their cars for the lower octane fuels available, but the general public may not realize the reason for their noisy engine and the need for readjustment. Rationing of fuel is anybody's guess, however the rationing of rubber should automatically reduce the demand for domestic fuel.

The oil refiner's biggest problem at present is to maintain a satisfactory operating balance between decreasing demand for domestic fuel and an increasing demand for aviation fuel. The oil companies' decisions to reduce or eliminate sale and distribution of third structure fuels was done in order to

use the tanks and trucking facilities for other grades of fuel.

Forty per cent of the Pacific Coast's lubricating oil requirements have in the past been shipped from the Eastern part of the United States. With transportation restricted, a certain pinch may be expected. However, Pacific Coast industry can expand some, to take care of this shift. Steel containers for lube oil will be a problem, and users will be required to return empties more quickly than in the past. Also, there will be a certain amount of substitutions in container materials.

Car production on the West Coast was reported at a standstill with all assembly plants now closed.

Truck deliveries were reported to be fairly satisfactory; however, used equipment is now almost unobtainable. Rather than have the government requisition trucks from their present operators, a plan has been worked out whereby Army, Navy or Quartermaster can direct a company to haul a certain amount of government freight along with their regular freight and at current commercial rates. In this way the government has the use of a certain number of trucks whenever need for emergency deliveries arises, while in between times the operators resume their regular commercial hauling schedules. Individual trucks thus remain in the hands of their private owners and operators, and are serviced and maintained by their private shops.

Under the subject of substitute materials, it was pointed out that bearings normally have a tin base, but that now with use of lead and cadmium restricted, aluminum and copper are being used in an increasing number of instances. Old bearings can be salvaged with a 20% recovery possible. However, this is not economical for the extremely thin bearings of 0.0025 thickness. In describing the many possibilities for the use of plastics, a transparent plastic boat was mentioned and it was remarked that such a boat might soon be useful to the Japanese in order to review their fleet.

"What can I do in my spare time to help defense?" was a personnel question which was answered only in part. Instruction and school work for enlisted men, and for reserve officers was one suggestion. Inspection work at some of the newly-started defense plants, especially armaments and small subcontractors was another suggestion. It was concluded that many SAE members are well qualified and willing to do such work if some program can be organized to use this pool of ability and energy.

Change Made in Rules Of Horning Memorial Award

UPON Council approval paragraph 5 of the rules for awarding the Horning Memorial Medal will read as follows:

"Should the Board of Award find that no paper of outstanding merit has been presented by an eligible person during any given calendar year, the medal and cash award for that year may be granted in recognition of distinguished active service in the field of mutual adaptation of fuels and engines, provided that the recipient shall first present a Horning Memorial Lecture on an appropriate subject at a designated meeting of the Society."

This change cannot take place until January, 1943, in accordance with the provisions of the rules of the award.

Tire Rationing Rules Explained By Administrator Mulcahy

■ Chicago

TIRE tribulations and the lure of a newly inaugurated "social half-hour" double-featured to bring out a record crowd of over 300 members and guests at the Chicago Section's Transportation & Maintenance Session's Feb. 2 meeting. Key speaker was Michael Mulcahy, Tire Rationing Administrator for the Chicago Metropolitan Area, who explained the rules and procedure governing the rationing of new rubber tires and tubes for cars and trucks as organized under the U. S. Coordinator of Civilian Defense for the Chicago Metropolitan Area, Mayor Edward J. Kelly.

In setting forth who's who and what's what in getting new tires, Administrator Mulcahy, introduced by Technical Chairman Glenn W. Johnson, transportation manager, Bowman Dairy Co., designated the Tire Rationing Board's job as one of administering the issuance of certificates for purchase of new tires to qualified applicants, under the eligibility classification system of the Office of Price Administration. Operation of the rationing administrative machinery, he pointed out, came under the wing of Civilian Defense because no budget or money appropriation for the work was available

ation in the field, Mr. Mulcahy declared.

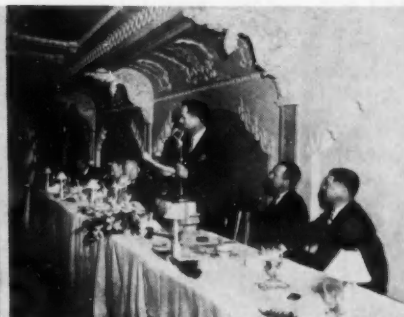
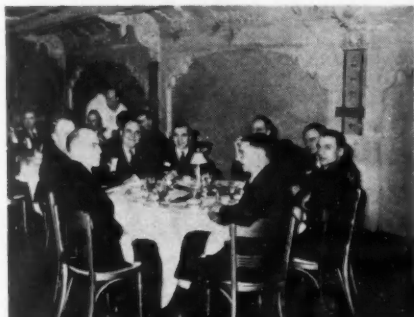
Discussing eligibility classifications, the section of the rules most pertinent to the vehicle user, the administrator pointed out that allotment of tires under the Chicago Area quota is made **FIRST** to certified applicants in four vital groups, (a), (b), (c), and (d), comprising users who operate vehicles essential to the preservation of the community's public health and safety; for example, vehicles for doctors, hospitals, fire-fighting services, police, public health and safety services, garbage disposal and sanitation services, public transportation conveyances, and similar agencies. Next in order is the fifth group, (e), comprising individuals, companies, and services operating vehicles primarily commercial or industrial in character, and which are rated by the OPA under nine classifications, according to the importance of each in preservation of public welfare or in the national defense effort. These nine ratings provide the life or death sentence on new tires for most commercial vehicle users. Here are the nine classifications in (e) cited by the Administrator:

1. Transportation of ice, and of fuel;
2. Transportation of material and equipment for the building and maintenance of public roads;
3. Transportation of material and equipment for the construction and

foods, provided that no certificate shall be issued for a new tire or tube to be mounted on a truck used (a) for the transportation of commodities to the ultimate consumer for personal, family, or household use; or (b) for transportation of materials for construction and maintenance except to the extent specifically provided by subsections 2, 3, 4, 5, and 6 of this section (e).

The sixth and seventh group classifications, (f) and (g), cover farm tractors or implements, and industrial mining and construction equipment, other than cars, or trucks, respectively. The above nine truck use classifications, it will be seen, eliminate vehicles for usual retail deliveries, for salesmen, inspectors, collectors, etc. The eligibility classifications of the OPA cannot be departed from and will be administered fairly and justly, said Mr. Mulcahy.

A barrage of questions recorded by listeners on question blanks greeted the speaker at the conclusion of his formal talk. Because many of the questions advanced by the audience are illustrative of uncertainties about the rules which exist in the minds of many vehicle users and dealers, we reproduce here typical questions that were asked, together with their answers as given by Administrator Mulcahy. Space permits showing only a few of the questions and answers as follows:



Photos, Courtesy of Bob Temple Associates

**CHICAGO GIRDS TO FACE
TIRE CURB:** Michael Mulcahy, Tire Rationing Administrator for the Chicago Metropolitan Area, tells record attendance of 300 members and guests what they must face in drastic curtailment of new tire use. (Left to right from microphone) Glenn W. Johnson, vice chairman of Transportation & Maintenance Activity; Leonard Gilbert, Chicago Section chairman; and D. C. Peck, assistant to president, Bowman Dairy Co.



under the regular state or municipal government set-up.

Explaining that because the task of setting up local rationing boards, appointment of inspectors as Federal agents, and selection of a staff to administer the rationing instructions, had to be rushed into action under time-table pressure, some irregularities perhaps might occur in the carrying out of the regulations and some questions doubtless would arise in the interpretation of the rules, particularly those with regard to eligibility classification. Any such difficulties, he felt, would be cleared away with the cooperation of the public and the tire administrative personnel. As fast as new amendments and clarifications of the rules were approved in Washington, they would be placed into oper-

maintenance of public utilities;

4. Transportation of material and equipment for the construction and maintenance of production facilities;
5. Transportation of material and equipment for the construction of defense housing facilities and military and naval establishments;
6. Transportation essential to render roofing, plumbing, heating and electrical repair services;
7. Transportation by any common carrier;
8. Transportation of waste and scrap;
9. Transportation of raw materials, semi-manufactured goods, and finished products, including farm products and

QUESTIONS AND ANSWERS

Q. Are salesmen entitled to get new tires where a car is needed to properly cover their assignments?

A. No.

Q. Just what procedure is necessary for an interstate carrier to obtain tires and tubes on trucks at distant points from the home port?

A. Where a vehicle is operating out of the jurisdictional area of its local Board, and a tire need arises which, unless met, will prevent safe operation of the vehicle, application may be made directly to the Tire Rationing Board having jurisdiction over the area in

Rentz To Assist Redding In Aeronautic Expansion

SO rapidly have the Society's aeronautical activities expanded, especially in the standardization work on aircraft engines, propellers, materials and processes, and accessories and equipment, that Edward W. Rentz, Jr., has been added to the SAE Headquarters' staff as assistant to James D. Redding, staff representative of aeronautical activities. Mr. Rentz will do special committee work.



Edward W. Rentz, Jr.

Formerly with Briggs Mfg. Co., Mr. Rentz has had broad experience in liaison work between laboratory and engineering departments and outside sources. After graduating from the University of Detroit with a Bachelor of Aeronautical Engineering degree, Mr. Rentz joined the Heywood Starter Co. and spent five years doing contact work with aircraft and aircraft-engine manufacturers throughout the country. Then came various jobs, including five years of sales engineering for plant equipment in Michigan.

While with Briggs, Mr. Rentz worked in the motor experimental department as liaison contact.

He is married, has one child, and for many years has resided in Detroit.

Mr. Rentz's activities as a member of the SAE staff began Feb. 24.

which the emergency developed. This board, through communication with the home board of the applicant, may act for the home board and issue a certificate for the tire, if all other eligibility requirements are made and this authority is conferred upon the foreign board by the home board.

Q. Can a farm implement dealer secure tires for his trucks which are used to deliver machines to farmers?

A. No.

Q. On tires purchased and paid for in July 1941 (proved by cancelled checks) prior to Dec. 11, 1941, can such tires be delivered to purchaser?

A. Not at present unless purchaser has certificate from a local board covering his need for these tires.

Q. If you are within the eligibility class, can you purchase tires smaller in size than 700/16's?

A. Yes.

Q. If no tires are available for truck delivery to ultimate consumer, does this apply to trucks delivering oil for home-heating purposes?

A. Oil for home-heating is "Fuel." Transportation of ice and fuel are eligible vehicles (e) 1.

Q. What tire sizes are considered as obsolete?

A. Following are sizes considered obsolete:

525-19	525-20	650-21
525-550-19	550-20	700-21
550-19	600-20	500-22
600-19	600-650-20	600-22
600-650/19	650-20	750-14
650-19	440-450-21	30X3
700-19	440-21	30X3 1/2
750-19	450-21	31X4
450-20	475-21	32X4
475-20	500-21	33X4
450-475-500/20	525-21	32X4 1/2
500-20	600-21	33X4 1/2
		34X4 1/2

Q. Can an engine serviceman get tires when he spends most of his time on emergency calls on government business, either directly on government owned engines or indirectly on engines used on defense jobs?

A. No.

Q. Is it possible to get a release on new trucks now in dealers' hands and purchased last October? The trucks will be used by a common carrier with interstate certificate.

A. No, except persons with a higher preference rating by the War Production Board may detail their qualifications and needs in an application to the WPB at Washington, D. C.

Q. Can a truck-leasing corporation secure tires, providing equipment is leased to a food manufacturer for delivery of finished products to retail outlets?

A. Yes.

Q. Is it true that fan belts and radiator hose will not be issued to vehicles using tires smaller than 700/20?

A. There is no rationing in fan belts and radiator hose at present.

Q. On newly purchased buses of over 10 passengers, tires are on a rental basis. Is it necessary to appear before the rationing board for certificates for the new tires to be installed on the new buses by the tire company?

A. Yes.

Q. If you operate in six states and move every other day, or at least once a week, what garage address should be given? Will no fixed location be satisfactory?

A. No. Address where vehicles are garaged or normally stationed should be given.

Q. No mention in tire rationing rules is made of contract carriers. If a contract carrier is engaged in transportation of vital armament materials, is he eligible for new tires?

A. Yes, see (e) 4, or (e) 5.

Q. In the event you have a truck that is not equipped with a spare tire, how can you secure one?

A. Apply to a local Tire Rationing Board.

Q. What becomes of the spare tire included in new cars sold to dealers prior to Jan 1?

A. The spare tire should be removed by the dealer to be held in stock and to be sold only to person holding a

certificate from a rationing board.

Q. Will the person who purchased tires for his personal car previous to the rationing program be subject to some embarrassment later on when these tires are installed to replace worn out tires?

A. No, providing delivery was made before the tire "freeze" order.

Q. Section (e) 3 provides for trucks used in transportation of material and equipment for the construction and maintenance of public utilities. Are tires used on trailers included in this section?

A. Yes.

A decided stimulant in attracting the record attendance at the February meeting was the new "social half-hour" which preceded dinner in the Grand Ballroom of the Knickerbocker Hotel. This event, sponsored by the White Motor Co. for the February meeting, is the first of a series of social sessions to be staged by the Chicago Section at coming meetings. Leonard Gilbert (White company), Chairman of the Chicago Section, presided at the meeting and introduced Glenn Johnson, technical chairman.

Club of Colorado Sees Engine Picture

■ SAE Club of Colorado

"THAT High Power Top Inch" was the title of a talking picture shown before the SAE Club of Colorado, Jan. 9, in the Festival Room at the Oxford Hotel, Denver. It was presented by Victor Freeburg, Perfect Circle Co., before 36 members of the Club.

Gas Turbine Progress Reviewed by Rettaliata

■ Milwaukee

TWO obstacles to the development of the combustion-gas turbine have been overcome in recent years—today's better materials enable temperatures of 1000 F to be used; and an axial compressor, upon which years of aerodynamical research have been spent, affords the necessary high-efficiency compressor unit. J. T. Rettaliata, Allis-Chalmers Mfg. Co., told 175 engineers and guests of the Milwaukee Section at the Feb. 6 meeting.

As this type of gas turbine is receiving much publicity, here and abroad, one might assume that it is a new invention. Mr. Rettaliata said, when, in reality, the first patents were taken out on one during the latter part of the 18th century. It was principally the development of metals which can stand extreme temperatures that has revived interest in this means of power.

Describing the action of a modern gas-turbine axial-compressor unit, Mr. Rettaliata said: "A five-stage reaction-type gas turbine is directly coupled to a fifteen-stage axial compressor. Air from the atmosphere enters the compressor where its pressure is raised. Part of the air discharged from the compressor is used for combustion purposes in the oil burner; the remaining air flowing through the annular space and cooling the products of combustion to a satisfactory turbine inlet temperature. The gas, a mixture of air and combustion products, then expands through the turbine from which it is exhausted to the atmosphere. The power

developed by the turbine is greater than that required by the compressor and the excess power is supplied to the generator. In order to start the unit from a standstill, a motor is provided to bring the unit up to about 25% of normal speed at which point the turbine is capable of driving the compressor.

"The unit is controlled by a speed governor connected to the fuel-oil supply," Mr. Rettaliata continued, "in this way the inlet-gas temperature to the turbine is varied, thus changing the power developed by the turbine. An emergency governor actuates a bypass valve around the turbine when a designated overspeed is exceeded. The turbine and compressor are connected through a solid coupling which enables their equal axial thrusts to neutralize each other, thus eliminating the necessity of balanced pistons."

At the present time the principal commercial application of the gas-turbine axial-compressor unit in the United States has been in oil refineries, Mr. Rettaliata told the engineering audience. A 2200-hp gas-turbine locomotive, with electrical transmission, is being built by Brown-Boveri for Swiss Federal Railways, he said. Other natural and favorable applications will develop from time to time and will probably include marine propulsion, blast-furnace plants, wind tunnels, special power plants, and other special applications, the speaker concluded.

Compounded Oils Discussed by Pigott

• Pittsburgh

COMPOUNDED oils do not eliminate the basic rate of change of deterioration of oil with temperature, R. J. S. Pigott, Gulf Research & Development Co., told 175 engineers at the Jan. 27 meeting of the Pittsburgh Section, but rather compounding delays the start of deterioration and lowers the absolute rate.

Mr. Pigott substituted for C. G. A. Rosen, Caterpillar Tractor Co., as the latter was prevented from attending by a conference with government officials.

Too many engineering problems recently have been left to the chemist to solve, Mr. Pigott said. He discussed several cases of lubrication difficulty and a method of analysis which shows accurately what any oiling system will do, and which can locate most of the troubles. The general fault nowadays is too low an oil flow over the bearings for cooling and unnecessarily high crankcase temperatures, he charged. (Mr. Pigott's talk was substantially the same as his paper printed in the May 1941 SAE Journal, p. 165.)

To stimulate discussion, Mr. Pigott said that when engine troubles occur it is an "easy out" to blame the oil or fuel. "This is much like a young doctor who tries to cover up a guess by saying 'It must be your tonsils,'" he said.

Comparing 1941 engines with those of 1931, Mr. Pigott showed that only about 20% of the greatly increased gain in power was due to higher compression ratios, most of the gain being due to improved breathing and increased revolutions. Since breathing losses go up as the cube of the speed, it is important that they be kept low, if maximum power is to be obtained. Mr. Pigott mentioned a racing engine which developed 1 1/2 hp per cu in. of piston displacement, chiefly due to large breathing capacity, but said that such engines did not run too well at less

SAE NATIONAL AERONAUTIC MEETING

HOTEL NEW YORKER • NEW YORK

MARCH 12-13

• TENTATIVE PROGRAM •

THURSDAY, MARCH 12

FRIDAY, MARCH 13

10:00 A.M. Aircraft Engine

C. F. Bachle, Chairman

Design Treatment of the Junkers

211-B Aircraft Engine

- Sidney Oldberg and T. M. Ball, Chrysler Corp.

Aircraft-Engine Radio Shielding

- D. W. Randolph, Apex Electrical Mfg. Co.

2:00 P.M. Aircraft Engine

R. F. Gagg, Chairman

Production Testing Equipment

- R. N. DuBois, Packard Motor Car Co.

- H. J. Buttner, Allison Division, General Motors Corp.

- C. A. Chayne, Buick Motor Division, General Motors Corp.

- R. Bealer, Ford Motor Co.

The Role of Surface Chemistry and Profile in Boundary Lubrication

- J. T. Burwell, Massachusetts Institute of Technology

8:00 P.M.

Aircraft and Aircraft Engine

J. G. Lee, Chairman

Fuel Consumption from the Airlines' Viewpoint

- M. Gould Beard, American Airlines, Inc.

Crash Proof Fuel Tanks

- J. W. Baird, Civil Aeronautics Administration.

10:00 A.M. Aircraft

Peter Altman, Chairman

Notes on Aircraft Icing and Its Prevention

- Willson H. Hunter, The B. F. Goodrich Co.

Aircraft Hydraulic Systems and Equipment

- Lt. Harry J. Marx, Bureau of Aeronautics, and Edward M. Greer, Simmonds Aero-accessories, Inc.

2:00 P.M. Aircraft

William Littlewood, Chairman

The Development of Impact Resistant Windshields

- Allen L. Morse, Civil Aeronautics Administration

Engineering Problems Associated with Air Cargo Transportation

- R. D. Kelly and W. W. Davies, United Air Lines Transport Corp.

BANQUET

7:00 P.M.

Details will be announced in an SAE Aeronautic Meeting program to be mailed to members

than 4500 rpm about where passenger-car engines left off.

The chemistry of combustion was discussed by Dr. William A. Gruse, Mellon Institute of Industrial Research, and Mr. Pigott added that complete combustion was never possible at normal combustion chamber conditions (up to 4800 F), and that this accounted for the presence of carbon monoxide gases in the exhaust.

Answering Bill H. Eaton, Bell Telephone Co. of Pa., as to the effect of lowering the octane rating of gasoline now available for civilian use, Mr. Pigott said, "Octane rating is only one factor in the quality of gasoline. In all other respects, the quality of the gasoline you will be getting for civilian use will be just as good as ever before."

Charles E. Chambliss, of General Motors Fleet Sales, discussed the effect of lower gasoline octane rating on truck and bus engines. It was brought out that the lower compressions would be easier on both spark plugs and coils and, where the cooling system was not in good condition, there might be more overheating, due to the need for using the lower gears of the transmission more frequently.

Murray Fahnestock, *Ford Field Magazine*, asked how much lead was needed to raise the octane rating 5 points for a railroad tank car holding 10,000 gal of gasoline. Dr. Gruse said it might be figured from the weight of the lead being about 0.02% of the weight of the gasoline, from which one of the slide-rule experts figured that it would take about 100 lb of lead for a tank car full of gasoline. But at 20 mpg, that much gasoline would take an automobile 200,000 miles or 8 times around the earth. About 100 lb of white lead are used to paint the wood trim on a brick house, or 200 lb of white lead for a frame house.

Answering W. Coyle Cochrane, Cities Service Oil Co., Mr. Pigott said it was probable that only the truck and bus operators, who have to operate for long periods at wide-open throttle, would have to do more than adjust the ignition to take care of the lower octane rating of present available gasolines. He said that probably 50% of the cars would not require any changes at all, as they had not been designed for the higher octane fuel. Another 40% would only have to have the ignition retarded, while the remaining 10% might require additional cylinder-head gaskets or restrictions in the air-fuel intake to prevent knocking from the use of lower octane fuel.

Regarding a possible shortage of gasoline in the immediate future, it was brought out that the Army and Navy are now demanding maximum output of 100-octane gasoline for aviation use and that the production of this aviation gasoline involves the production of plenty of ordinary commercial gasolines, which, because they cannot be economically stored, must be used. The vital need for aviation gasoline now leaves automobile gasolines again as a "byproduct," just as they were in the days of kerosene lamps, when gasoline was dumped into the rivers.

It is estimated that 70% of gasoline production has been used in passenger cars, and 30% in trucks and buses. If we cut the use of passenger cars by 50%, 35% of entire U. S. gasoline production would be available for the Army and the Army isn't using nearly that much yet; but certainly will ultimately.

Now that the gasoline refineries have the added problems of producing butane, and other gases for the manufacture of synthetic rubber for tires, the oil refining business is becoming more complicated, it was concluded.

About SAE Members

(Concluded from page 27)

MERRILL C. HORINE, sales promotion manager, Mack Mfg. Corp., has been appointed engineering consultant to the Office of The Quartermaster General, Washington, D. C. He has been active as chairman or member of numerous SAE technical committees, and served as chairman of the Metropolitan Section.

PAUL G. HOFFMAN, president of Studebaker Corp., has been appointed chairman of United China Relief. Wendell L. Willkie will serve as honorary chairman, and James G. Blaine, last year's chairman, becomes treasurer of the organization in which nine national agencies are cooperating.

New SAE committee appointments made recently include: **N. N. TILLEY** to serve for three years on the Manly Memorial Medal Board of Award; **WILLIAM LITTLEWOOD** to serve for three years on the Wright Brothers Medal Board of Award; **W. M. HOLADAY** to serve three years on the Harry L. Horning Memorial Award Committee; and **DAVID BEECROFT** and **W. B. STOUT**, to serve for three years on the Clarkson Memorial Committee.

A. W. SCARRATT has been appointed chairman and **H. S. EBERHARD** and **E. F. NORELIUS** members of the Air Cleaner Subcommittee of the SAE Ordnance Advisory Committee.

WILLIAM WADDELL recently resigned his position as engine designer, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn., and has joined the Lycoming Division, The Aviation Corp., Williamsport, Pa., as chief draftsman.

Former Purdue University student **JOSEPH E. ACHOR**, now is employed in the hydraulic engineering department of Bendix Aviation Corp., South Bend, Ind.

RALPH H. KRESS, who has been New England zone manager, General Motors Corp., in Boston, has been transferred to the Washington office as zone manager, for Maryland, District of Columbia, and Virginia, with additional duties to lend assistance technically and mechanically to the resident manager, Fleet Sales, in charge of Government Sales.

JOHN P. GOBETTI, who was a Class "A" layout engineer, Glenn L. Martin Co., Baltimore, Md., now is a group engineer with the same company.

HERMAN B. DHONAU has been transferred from the Philadelphia plant of the General Electric Co. to the Schenectady plant.

Obituaries

Louis W. Greve

Louis W. Greve, president of the Cleveland Pneumatic Tool Co. and director of the National Air Races of Cleveland, Inc., died Feb. 2 at the age of 59. He and his wife were on vacation at Fort Lauderdale, Fla., when he was stricken with a heart ailment. Mr. Greve started as office boy with the Cleveland Pneumatic Tool Co. at the turn of the century and worked his way up to the presidency. He received numerous patents on compressed air devices, and pneumatic tools. Surviving is his widow, the former Elsie Baldwin.

Albert S. Harvey

One of the leading industrialists of Saginaw, Mich., Albert S. Harvey, president and general manager, U. S. Graphite Co., died suddenly Nov. 25, 1941, at the age of 51. Mr. Harvey worked up from a member of the sales department to presidency of the company his father, Thomas A. Harvey, helped found. In a short time and under his leadership it has become one of the largest plants of its kind in the world. Extremely social-minded Mr. Harvey was associated with nearly all of Saginaw's charitable and business institutions, and hundreds of his employees and Saginaw citizens greeted him as "Al."

He joined the Society in 1927 and was active in its work.

Charles D. Cutting

Charles D. Cutting, president, Cutting Sales & Engineering Co., died Dec. 16, in Detroit. Mr. Cutting was an automobile pioneer, having produced the Cutting automobile during the years 1910-14. It was during this period he joined the SAE. In Chicago as a young man he attained recognition as a bicycle racer. From 1915 he was associated with his son, Herbert A., in the Cutting Engineering Co.

A. E. Wetterborg

A. E. Wetterborg, manager of Federal-Mogul Service, a division of Federal-Mogul Corp. in Portland, Ore., died Nov. 26, after a long illness. From 1920 to 1931, Mr. Wetterborg was a buyer for Goodyear Rubber Co., and from 1933 to 1934 he was similarly employed by West Bearing Co. He joined Federal-Mogul in 1934, and remained there until his death.

George L. Hawn, Sr.

George L. Hawn, Sr., 70-year-old sales representative, Sealed Power Corp., Muskegon, Mich., died Dec. 31, 1941. He had been an employee of Sealed Power for sixteen years. In his long career in the automotive business, Mr. Hawn worked for Olds Motor Works, Continental Motors Corp., The Piston Ring Co., and other prominent companies. He became a member of the SAE in 1928.

J. Ross St. Germain

J. Ross St. Germain, automotive fleet engineer, Ethyl Gasoline Corp., Baltimore, Md., died Sept. 6, 1941, at the age of 41 years. During his career he did trouble shooting on marine engines for Hall-Scott Motor Co., as well as experimental and research work for other automotive organizations. He joined Ethyl Gasoline in 1934, just three years before he became a member of the Society.

Frank R. Schubert

Died of a heart attack, Feb. 4. Assistant general manager of the Houde Engineering Corp., Buffalo, N. Y., and an internationally-known industrial engineer, Frank Schubert was at one time vice president of McGill Metal Co., Valparaiso, Ind., and assistant to the president of the Bearings Co. of America, Lancaster, Pa. He was 47 years old at the time of his death.

In 1930 and 1931, Mr. Schubert was in Russia as consulting engineer and works manager of the first U.S.S.R. anti-friction bearing plant in Moscow. He joined Houde in 1936.

SAE Coming Events

March 12-13 National Aeronautic Meeting
Hotel New Yorker - New York City
(For program, see page 33)

May 31 - June 5 Semi-Annual Meeting
The Greenbrier - White Sulphur Springs, West Va.

Sept. 24 - 25 National Tractor Meeting
Hotel Schroeder - Milwaukee, Wis.

Baltimore - March 5
Engineers Club; dinner 7:00 p.m.

Buffalo - March 11
Progress of Aviation, Old and New. "The Old" - Max Stupar, chief engineer, Bell Aircraft Corp. "The New" - Fred Flader, chief engineer, Curtiss Aeroplane Division, Curtiss-Wright Corp. "The Army" - Major Clyde H. Mitchell, U. S. Army Air Corps.

Chicago - March 3
Knickerbocker Hotel; dinner 6:45 p.m. Harvester's Activities in Peace and War - A. W. Scarratt, vice president, Engineering and Patents, International Harvester Co. Moving Pictures. Defense Exhibit - Products Manufactured for Military and Naval Use.

Cleveland - March 9
Cleveland Club; dinner 6:30 p.m. Airline Service and Maintenance - Charles Froesch, chief engineer, Eastern Airlines. Coffee Speaker: Major Al Williams, Gulf Oil Co.

Colorado Club - March 17
Denver Municipal Airport; 8:00 p.m. Types of Propellers and Installations - Paul Briggs, president, Aviation Institute of Denver. Airplane Propellers and Wheel Balancing - Marcellus Merrill. Mr. Merrill will also demonstrate equipment.

Dayton - March 2
Biltmore Hotel; dinner 6:30 p.m. Crystal Gazing for the Motor Car of the Future - Joseph Geschelin, Detroit technical editor, Chilton Co.

Detroit - March 2 & 23
March 2. Hotel Statler. Joint meeting with American Welding Society. Designing and Tooling for Modern Production Weld-

ing - Paul Merriman, Glenn L. Martin Co. The Fifth Column in Michigan - Lt. Harold Mulbar, Deputy Chief of Detectives, State of Michigan.

March 23. Hotel Statler. Subject: Problems in Flying High-Speed Planes.

Indiana - March 19
Antlers Hotel, Indianapolis; dinner 6:45 p.m.

Metropolitan - March 12-13
Participation in SAE National Aeronautic Meeting, Hotel New Yorker, New York City.

Milwaukee - March 6
Milwaukee Athletic Club; dinner 6:30 p.m. Substitute Steels - John Mitchell, metallurgical engineer, Alloy Steel Products, Carnegie-Illinois Steel Corp. Regularly called Business Session of SAE Tractor and Industrial Activity for election of members to Activity's Nominating Committee.

New England - March 19
Engineers Club, Boston; dinner 6:30 p.m. Fuel and Oil to Keep Them Rolling - George H. Freyermuth, assistant manager, Engineering Division, Sales Department, Standard Oil Co. of N. J.

Northwest - March 12
Crawford's Seafood Grill, Seattle; dinner 7:00 p.m. Diesel Combustion and Lubrication - Wallace Linville, chief automotive engineer, General Petroleum Corp. of Calif.

Oregon - March 13
Benson Hotel, Portland; dinner 7:00 p.m. Diesel Maintenance - Bert Ohler, Automotive Products, Inc. Inspection trip through plant.

Southern California - March 13 & 27
March 13. Hollywood Athletic Club, Los Angeles. Aircraft Accessories Meeting. Heat

Exchangers for High-Altitude Flying - Walter R. Ramsaur, Airesearch Mfg. Co. Hydraulic Control Systems for Aircraft - Speaker to be announced.

March 27. Dinner Dance.

Syracuse - March 23

Onondaga Hotel; dinner 6:30 p.m. Speaker to be announced.

Washington - March 19

Armstrong School, Hampton, Va. Joint meeting with Virginia Peninsula Engineers' Club. Speaker - A. T. Colwell, vice president, Thompson Products, Inc.

Aircraft Engineering

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NEW MEMBERS Qualified

These applicants who have qualified for admission to the Society have been welcomed into membership between Jan. 15, 1942, and Feb. 15, 1942.

The various grades of membership are indicated by: (M) Member; (A) Associate Member; (J) Junior; (Aff.) Affiliate Member; (SM) Service Member; (FM) Foreign Member.

Buffalo Section

Hamsher, John W. (J) Curtiss-Wright Corp., Engineering Department, Buffalo,

N. Y. (mail) 60 Main St., Dansville, N. Y.

Canadian Section

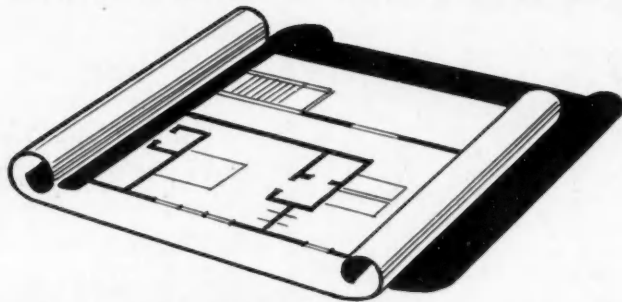
Green, R. E. Stewart (A) Ontario sales



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Morris, Russell L. (M) garage superintendent, John Labatt, Ltd., Simcoe St., London, Ont.

Zojac, Walter Ronald (J) automotive engineer, Ford Motor Co. of Canada, Windsor, Ont. (mail) 1479 Hickory Rd.

Chicago Section

Blaul, Walter L. (M) truck equipment, Axle & Equipment Sales Co., 211 E. 23rd St., Chicago.

Galandak, August J. (J) mechanical research engineer, Victor Mfg. & Gasket Co., 5750 W. Roosevelt Rd., Chicago (mail) 2801 S. St. Louis Ave.

Mashinter, William H. (J) research engineer, Standard Oil Co. (Ind.) Whiting, Ind. (mail) 7541 S. Cornell, Chicago.

Owen, Jack (A) purchasing agent, Western-Austin Co., 601 Farnsworth Ave., Aurora, Ill.

Steder, Marshall (A) assistant general manager, L. J. Miley Co., Inc., 1060 W. Adams St., Chicago.

Triplett, Harlow A. (J) engine tester, Electro-Motive Corp., LaGrange, Ill. (mail) 1624 Elmwood Ave., Wilmette, Ill.

Cleveland Section

Bredenbeck, Bill (J) experimental work, Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland (mail) 4006 Russell Ave., Parma, Ohio.

Chormanski, Casper W. (J) project engineer, Pump Engineering Service Corp., 12910 Taft Ave., Cleveland (mail) 3837 E. 57th St.

Farr, Arthur Harrison (J) development engineer, Thompson Products, Inc., Cleveland (mail) 17463 Clifton Blvd., Lakewood, Ohio.

Holt, Ray G. (J) test engineer, Pump Engineering Service Corp., Cleveland (mail) 21530 Edgely Dr., Euclid, Ohio.

Johnson, Robert Sheldon (J) development engineer, Thompson Products, Inc., Cleveland (mail) 1453 Lincoln Ave., Lakewood, Ohio.

Kanavel, Charles H. (A) sales engineer, B. F. Goodrich Co., 500 S. Main St., Akron, Ohio.

Kraus, John Walter (J) industrial engineer, Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland (mail) 3328 Euclid Ave.

Menge, John C. (A) patent clerk, Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland.

Schaaf, Oliver H. (A) vice president, general manager, Air-Maze Corp., 5200 Harvard Ave., Cleveland.

Schutte, Robert M. (J) experimental engineer, Thompson Products, Inc., 1694 E. 82nd St., Cleveland.

Dayton Section

Geddes, W. Hayward (M) research engineer, United Aircraft Products, Inc., Huffman & Linden Aves., Dayton.

Detroit Section

Declerck, Oscar G. (J) aircraft supervisory training, Chrysler Corp., Detroit (mail) 1250 LeMay Ave.

Emerson, Francis Horton (M) assistant professor, College of Engineering, Wayne University, Detroit (mail) 15062 Winthrop Ave.

Everett, Milton C. (M) chief draftsman, Briggs Mfg. Co., Research Design Depart-

ment, Detroit (mail) R.F.D. #2, Rochester, Mich.

Fox, Harold E. (M) technical engineer, General Motors Truck & Coach Division, Yellow Truck & Coach Mfg. Co., Pontiac, Mich.

Frantz, Ralph S. (M) assistant chief body engineer, charge of sheet metal, Cadillac Motor Car Division, General Motors Corp., 2860 Clark Ave., Detroit.

Habermann, W. A. (M) sales engineer, American Brakeblok Division, American Brake Shoe & Foundry Co., 4600 Merritt Ave., Detroit.

Jahncke, Donald Edward (J) apprentice tool engineer, Plymouth Division, Chrysler Corp., Detroit (mail) Apt. 106, 340 E. Grand Blvd.

Laing, Robert W. (J) supercharger test engineer, Packard Motor Car Co., 1580 E. Grand Blvd., Detroit (mail) 15281 Carlisle Dr.

Mattson, Raymond Lionel (J) junior research engineer, General Motors Corp., Research Laboratory Division, 8-108 Research Bldg., 485 W. Milwaukee Ave., Detroit.

Nimrick, Harold C. (M) production engineer, Packard Motor Car Co., Detroit (mail) 6438 E. Forest Ave.

Oxley, Herbert (J) research engineer, General Motors Corp., Research Laboratory Division, Detroit (mail) 92 Elm St., Pontiac, Mich.

Rothrock, George L. (M) engineer, Cadillac Motor Car Division, General Motors Corp., Detroit.

Shabluk, Henry (J) draftsman, Continental Aviation & Engineering Corp., 12801 E. Jefferson, Detroit (mail) 2414 McPherson.

Shaeffer, George D. (M) chief engineer, road machinery division, Gar Wood Industries, Inc., 7924 Riopelle St., Detroit.

Shields, James Joseph (J) aircraft engine design, Continental Aviation & Engineering Corp., Detroit (mail) 18255 Woodingham Dr.

Smith, Charles J. (M) manager, proving ground, Packard Motor Car Co., 1580 E. Grand Blvd., Detroit.

Stinson, Lawrence E. (J) research engineer, Ethyl Gasoline Corp., Detroit (mail) Apt. D-8, 680 Delaware.

Indiana Section

Klein, John J. (M) assistant to the president, Marmon-Herrington Co., Inc., Indianapolis (mail) 1511 W. Washington St.

McCaul, Gerald Joseph (J) test engineer, Allison Division, General Motors Corp., Indianapolis (mail) 4520 N. Carrollton Ave.

Metropolitan Section

Albright, Ralph (J) automotive engineer, Socony-Vacuum Oil Co., Inc., 412 Greenpoint Ave., Brooklyn, N. Y. (mail) 32-25 93rd St., Jackson Heights, L. I., N. Y.

Barta, James E. (J) experimental test engineer, Curtiss-Wright Corp., Propeller Division, Caldwell, N. J. (mail) 130 Market St., Passaic, N. J.

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Price, John Francis (J) assistant supervisor



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of installation drawings, Wright Aeronautical Corp., Paterson, N. J. (mail) 726 E. 22nd St.
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Shaw, Harry E. (A) president, Service Supply Corp., Philadelphia (mail) 2001 W. Venango St.

Towle, Joseph H. (A) sales engineer, Towle & Son Co., 18 W. Cheltenham Ave., Philadelphia.

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Wallace, Gerald W. (M) chief chemist, Freedom Oil Co., Freedom, Pa.

St. Louis Section

Creveling, A. Ben, Jr. (J) test engineer, American Car & Foundry Co., St. Charles, Mo.

Minges, Harold A. (J) junior engineer, Busch-Sulzer Bros. Diesel Engine Co., Second & Utah Sts., St. Louis, Mo. (mail) 3946a Fairview.

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Southern New England Section

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Tulsa Group

Hilligoss, Raymond G. (J) assistant professor, Oklahoma A. & M. College, Stillwater, Okla.

Wichita Section

Garrett, Thomas R. (A) president, Universal Motor Oils Co., Inc., 317-21 N. Wichita St., Wichita, Kan.

Outside of Section Territory

Cureton, Andrew S., Capt. (A) U. S. Army, Quartermaster Corps, Company 1, 53rd Quartermaster Regiment, Fort Bragg, N. C.

Epler, Horace W. (M) group leader, Engineering Department, Lycoming Division, The Aviation Corp., Williamsport, Pa. (mail) 1052 Louisa St.

Prevost, Albert A. (M) metallurgical engineer, Phelps-Dodge Corp., Clarkdale, Ariz. (mail) Clarkdale, Ariz.

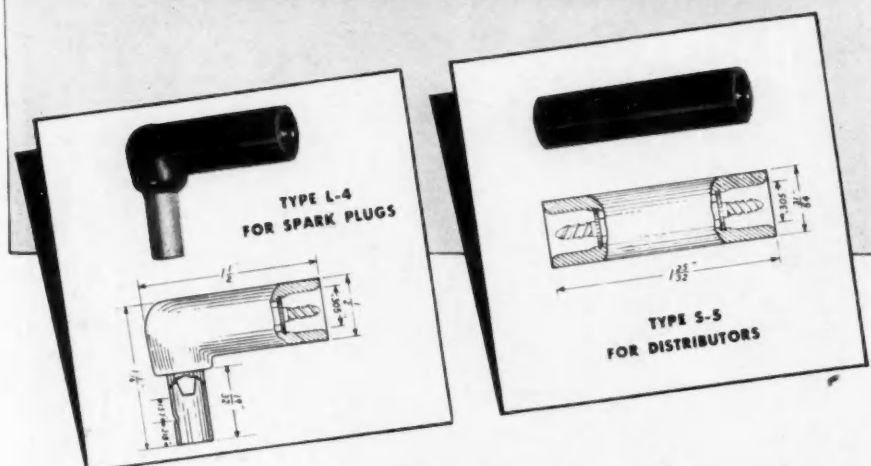
Rollo, J. Curwen (J) senior draftsman, Clark Ruse Aircraft, Ltd., Dartmouth, Nova Scotia, Canada.

Foreign

Doctor, Behram (FM) transport officer, Bombay Municipal Corp., Bombay, India (mail) Allana Chamber, Bomanji Petit Rd., Cumballa Hill.

Stokes, Donald Gresham, Major (FM) officer, charge of workshops, Royal Army Ordnance Corps, 61st Divisional Workshop, Home Forces, England (mail) "Bodrigan" Bow Green Rd., Bowdon, Cheshire, England.

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APPLICATIONS Received

The applications for membership received between Jan. 15, 1942, and Feb. 15, 1942, are listed below. The members of the Society are urged to send any pertinent information with regard to those listed which the Council should have for consideration prior to their election. It is requested that such communications from members be sent promptly.

Baltimore Section

Leuang, William Arthur, stress engineer, Glenn L. Martin Co., Baltimore.

Buffalo Section

Allshouse, Clair Barnhart, 374 Richmond Ave., Buffalo.

MacKendrick, John N., chief engineer, Clark Bros. Co., Olean, N. Y.

Canadian Section

Anglin, Arthur Baker, industrial engineer, British American Oil Co., Ltd., Toronto, Ont.

Beattie, Frank S., co-ordinator, Brantford Coach & Body Co., Brantford, Ont.

Ley, Charles H., sales manager and director, Dominion Wheel & Foundries, Ltd., Toronto, Ont.

McGorman, Donald G., superintendent, Schultz Die Casting Co. of Canada, Ltd., Toronto, Ont.

Chicago Section

Bird, Paul G., research director, National Aluminate Corp., Chicago.

Eastman, James M., design engineer, Bendix Products Division, Bendix Aviation Corp., South Bend, Ind.

Fairlie, M., development department, Sinclair Refining Co., East Chicago, Ind.

Hines, Lee D., automotive engineer, Sinclair Refining Co., East Chicago, Ind.

McCoy, Ewald H., non-ferrous analytical chemist, aviation division, Studebaker Corp., Chicago.

Parish, Harold C., Jr., laboratory assistant, Commercial Fitters Corp., South Bend, Ind.

Payne, Frank E., president, Crane Packing Co., Chicago.

Teeple, Charles Paul, vice president in charge of research, Crane Packing Co., Chicago.

Cleveland Section

Beatty, Robert D., Jr., chief engineer, heater division, Eaton Mfg. Co., Cleveland.

Beecher, Eugene L., chief engineer, The Gabriel Co., Cleveland.

Chrysler, Robert W., assistant engineer, National Bronze & Aluminum Foundry Co., Cleveland.

Emmons, Richard Fox, technical apprentice, White Motor Co., Cleveland.

Fisher, Othal H., chief engineer, National Bronze & Aluminum Foundry Co., Cleveland.

Glanzer, Clarence J., test and development engineer, Air-Maze Corp., Cleveland.

Kuhnert, Glenn C., specifications engineer, Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio.

Minshall, Robert J., president, Pump Engineering Service Corp., Cleveland.

Nilges, William C., designer, Pump Engineering Service Corp., Cleveland.

Patterson, Ian David, development engineer, Goodyear Tire & Rubber Co., Akron, Ohio.

Sedlak, Joseph, president, Sedlak Machine Products Co., Cleveland.

Thomas, Walter S., supervisor central systems, Thompson Aircraft Products Co., Cleveland.

Vorac, Frank Thomas, mechanical engi-

neer, Pump Engineering Service Corp., Cleveland.

Dayton Section


Conrad, Donald, carburetion test inspection, Wright Aeronautical Corp., Cincinnati, Ohio.

Nay, Paul Franklin, Capt., U. S. Army, Air Corps, Materiel Division, Wright Field, Dayton.

Peterson, David C., works manager, Superior Engine Division, The National Supply Co., Springfield, Ohio.

Stuart, Joseph, III, technical research engineer, Aeroproducts Division, General Motors Corp., Dayton.

Wuellner, Richard W., senior test engi-



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neer, Wright Aeronautical Corp., Lockland, Ohio.

Zisette, R. R., district manager, SKF Industries, Inc., Cincinnati, Ohio.

Detroit Section

Ayers, Chalmers, methods engineer, Long Mfg. Division, Borg-Warner Corp., Detroit.

Ball, Laurence M., head of sound and vibration laboratory, Chrysler Corp., Detroit.

Bracken, D. J., works manager, Fisher Body Pontiac Division, General Motors Corp., Pontiac, Mich.

Clark, Robert E., automotive engineer, Chrysler Corp., Highland Park, Mich.

Hammond, John G., regional engineer, Metallizing Engineering Co., Inc., Detroit.

Hawley, Myron, development engineer, Morse Chain Co., division of Borg-Warner Corp., Detroit.

Hiersch, Frederick A., instructor mechanical engineering department, University of Michigan, Ann Arbor, Mich.

Hittell, John L., tool design engineer, Ex-Cell-O Corp., Detroit.

Kemp, Kenneth J., assistant manager, Holland Precision Parts, division of Bohn Aluminum & Brass Corp., Detroit.

Kline, John Francis, critical materials analysis, Cadillac Motor Car Division, General Motors Corp., Detroit.

Norwick, William Kenneth, supervisor, Fisher Body Detroit Division, General Motors Corp., Detroit.

Pattison, Wayne W., project and design engineer, Bohn Aluminum & Brass Corp., Detroit.

Johnstone, Theodore H., research engineer, Yale & Towne Mfg. Co., Detroit.

Rogers, Harry L., draftsman, Livermore Corp., Detroit.

Salisbury, Glen D., district manager, Phoenix Oil Corp., Cleveland, Ohio. Mail: 6342 Cass Ave., Detroit.

Schlosser, Arthur G., chief engineer, Candler-Hill Corp., Detroit.

Smith, V. C., president, Auto Parts Co., Inc., Ann Arbor, Mich.

Thill, Walter E., assistant design engineer, Federal Mogul Corp., Detroit.

Tousley, F. M., research engineer, Briggs Mfg. Co., Detroit.

Indiana Section

Golden, L. Duke, replacement sales engineer, Perfect Circle Co., Hagerstown, Ind.

Goldthwaite, John L., engineer, Allison Division, General Motors Corp., Indianapolis.

McConnell, Charles K., assistant carburetor engineer, Delco Radio Division, General Motors Corp., Kokomo, Ind.

Reiners, Neville M., engineer, Cummins Engine Co., Columbus, Ind.

Wurster, Lee H., engineer, Propeller Division, Curtiss-Wright Corp., Indianapolis.

Metropolitan Section

Ahrens, Harry T., technical supervisor, Hygrade Products Co., Inc., Long Island City, N. Y.

Barrett, Hillard E., draftsman, Wright Aeronautical Corp., Paterson, N. J.

Bennett, Arthur J., fleet superintendent, General Diaper Service, Inc., Elmhurst, L. I., N. Y.

Damato, Dominick A., shop foreman, Damato's Automotive & Ignition Service, Arverne, L. I., N. Y.

Fegley, Frederic C., chief, service division, Brewster Aeronautical Corp., Long Island City, N. Y.

Fusselman, Wilbur Frank, production engineer, Titeflex Metal Hose Co., Newark, N. J.

Hebert, Donald R., student engineer, Wright Aeronautical Corp., Paterson, N. J.

Hoag, Harry James, Jr., engineering

trainee, Wright Aeronautical Corp., Paterson, N. J.

Moore, Francis W. M., chief examiner, inspection of aircraft engines for government, British Air Commission, Wright Aeronautical Corp., Paterson, N. J.

Moreland, William J., dynamometer operator, Gulf Oil Corp., New York City.

Moreton, Douglas H., research engineer, Standard Oil Development Co., Bayway, N. J.

Palermo, John J., junior engineer, Simmonds Aerocessories, Inc., Long Island City, N. Y.

Simon, Jack J., laboratory tester, International-Plainfield Motor Co., Plainfield, N. J.

Smith, Hugh L., operations manager, American Airlines, Inc., Jackson Heights, N. Y.

Wilson, Carroll J., chemical engineer, research division, Standard Oil Development Co., Elizabeth, N. J.

Milwaukee Section

Peden, Douglas Tillotson, chief research engineer, Micromatic Hone Corp., Milwaukee.

New England Section

Aldham, Thomas Edward, vice president in charge of purchasing, Fram Corp., East Providence, R. I.

Francis, Albert S., assistant manager, Kendall Paper Co., Cambridge, Mass.

Hayes, James C., sales representative, Toledo Steel Products Co., Toledo, Ohio. Mail: 1737 Cambridge St., Cambridge, Mass.

Wilson, Steven B., president, Fram Corp., East Providence, R. I.

Northern California Section

Edlefsen, Robert, engineer, Joslyn & Ryan, San Francisco, Calif.

Railton, Edward E., Jr., draftsman, Hill Scott Motor Car Co., Berkeley, Calif.

Sherman, Earl H., owner, Earl Sherman & Co., Oakland, Calif.

Northwest Section

Christensen, Ray G., power plant development engineer, Boeing Aircraft Co., Seattle, Wash.

Pearson, Wendell H., armament engineer, Boeing Airplane Co., Seattle, Wash.

Strain, Lamar A., vice president, Strain's Garage, Kent, Wash.

Oregon Section

Hlobil, Josef S. J., president and general manager, Columbia Aircraft Industries, Portland, Ore.

Philadelphia Section

Marmor, Adrian, superintendent of department, Hale Fire Pump Co., Inc., Conshohocken, Pa.

Rath, Harry Brinker, experimental test engineer, Mack Mfg. Corp., Allentown, Pa.

Pittsburgh Section

Ference, Stephen, director of service, Chrysler Pittsburgh Co., Inc., Pittsburgh.

St. Louis Section

Wainwright, William N., chief project engineer, McQuay-Norris Mfg. Co., St. Louis.

Zenzen, John Andrew, sales engineer, The Herman Body Co., St. Louis.

Southern California Section

Barrie, Allan A., airline captain, Western Air Lines, Inc., Burbank, Calif.

Bedal, Eugene Delmar, layout draftsman, Douglas Aircraft Co., El Segundo, Calif.

Cressey, Donald E., aeronautical engineer, Douglas Aircraft Co., Inc., Santa Monica, Calif.

Kornblum, Alvin J., assistant project engineer, Vega Aircraft Corp., Burbank, Calif.

Litke, Bernhardt J., instructor, Ryan School of Aeronautics, San Diego, Calif.

Petersen, Edward M., transportation superintendent, Wilson & Co., Inc., Los Angeles.

Rogne, Conrad Oliver, Jr., tool designer, Vega Aircraft Corp., Burbank, Calif.

Sanders, Ray, vice president, general manager, Turco Products, Inc., Los Angeles.

Seeds, Norton H., supervisor, North American Aviation, Inc., Inglewood, Calif.

Sellstrom, Lawrence T., shop foreman, Knudsen Creamery Co., Los Angeles.

Shaffer, Glenn C., sales engineer, American Chain & Cable Co., Inc., Los Angeles.

Sparks, Arthur S., chief engineer, Thorne Engineering Corp., Burbank, Calif.

Woodhead, Harry, president, Consolidated Aircraft Corp., San Diego, Calif.

Southern New England Section

Broders, Claude Owen, designer, Pratt & Whitney Aircraft, division of United Aircraft Corp., East Hartford, Conn.

Brown, Arthur Austin, assistant project engineer, Pratt & Whitney Aircraft, division of United Aircraft Corp., East Hartford, Conn.

Mitchell, Donald W., student, University of Connecticut, Storrs, Conn.

Washburn, Frank K., electrical technician, Echlin Mfg. Co., New Haven, Conn.

Syracuse Section

Moomis, Philip LeRoy, Lt., U. S. Army, instructor, Military Department, Cornell University, Ithaca, N. Y.

Tulsa Group

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Washington Section

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Sather, Bernard I., assistant mechanical engineer, National Advisory Committee for Aeronautics, Langley Field, Hampton, Va.

Wichita Group

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Williams, Romeyn S., supervisor, tool and die, Cessna Aircraft Co., Wichita, Kan.

Outside of Section Territory

Ackerman, Virgil D., engineer, Hastings Mfg. Co., Hastings, Mich.

Bailey, D. Phillips, automotive engineer, Tide Water Associated Oil Co., Albany, N. Y.

Gaspari, Hannibal J., research chemist, Yale Oil Corp., Billings, Mont.

Klompas, William M., engine overhaul, Mackenzie Air Service, Edmonton, Alta., Canada.

Manley, St. Clair L., service manager, Smyth & Arnold, Oakbank, Man., Canada.

Nash, Donald F., mechanic, Mackenzie Air Service, Ltd., Edmonton, Alta., Canada.

Ritchie, Allan V., superintendent, research laboratories, The Texas Co., Beacon, N. Y.

Victor, M. Thomas, sales engineer, Keystone Carbon Co., St. Mary's, Pa.

Wallace, John J., assistant chief engineer, Bristol Aircraft Division, Universal Moulded Products Corp., Bristol, Va.

Work, Edgar A., chief engineer, The Lancaster Lens Co., Lancaster, Ohio.

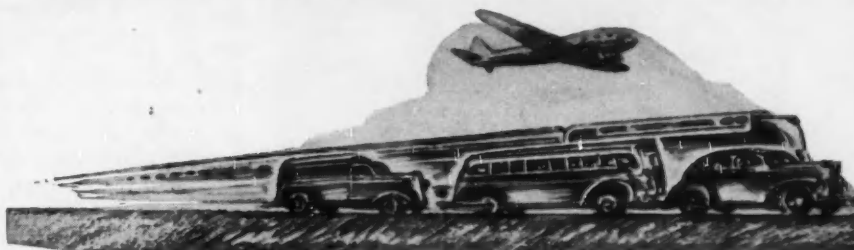
Foreign

Bailey, A. H. Harvey, defect investigation engineer, Rolls-Royce, Ltd., Derby, England.

Ferraz, Humberto M. C., manager engineer, Ecol, Lisbon, Portugal.

SAE JOURNAL *Pre-Prints*

THE SOCIETY
OF
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*News of the
MAY
Issue*

By Norman I. Shidle

Everybody's Right . . . or Wrong

It's a good many years since America, as a nation, has had any practice in making a little bit go a long way. Our resources have seemed inexhaustible; the ability of our technicians to use them effectively without limit.

Now we are fighting for our lives - and we really are short of many materials - not for civilian use alone, but short of materials to build immediately-needed military equipment. We haven't had practice in facing such shortages. That's why so many people are blaming so many other people for the trouble. Every group can, and does, point to wasteful use of materials by many other groups - and turns defensive when other groups point accusing fingers back at them.

The fact of the matter is that almost everybody is right - or wrong, if you want to look at it that way. There isn't a materials-using group in the country, civilian, governmental or military, that has not been chewing up more critical pounds than necessary. A good deal of paper even is wasted talking about wasteful use of paper.

What does it all add up to?

Just this:

America - industrially and personally - is only now engaged in spring practice for getting along just as well with less. The real season is just beginning. Very shortly, every group will be so busy materials-economizing in order to function at all, that nobody will have time to check up on the other fellow - and the other fellow won't need to be checked on, either.

CAST-IRON PISTON CASE STUDIES WILL HELP MILITARY CONVERSION

AMERICA'S trump card in this war of wars is its engineering experience in design and production of motor vehicles. You've heard that time and again through radio and press. One all-essential corollary that has been stressed through the years by the SAE Journal is the compilation of this experience and making it available to all who can use such knowledge.

Journal Scores Again

We are proud to announce an especially important round-up story for May. It's called "Problems Involved in Changing from Aluminum to Cast-Iron Pistons" and contains material of practical value to engineers and military officials engaged in the difficult task of producing top-notch military vehicles for our giant army, and doing so with a minimum amount of critical materials.

As aluminum demands of our aircraft industry mount daily, substitu-

tion from aluminum to iron or steel pistons in many types of military vehicles becomes more and more essential.

Automobile Industry Has Experience

The automobile industry has a wealth of design knowledge on cast-iron or cast-steel pistons. . . . Early cars all were built with them, and more than a year before Pearl Harbor when aluminum shortages first loomed, intensive design and development work to shift all cars from aluminum pistons was inaugurated.

To make available this knowledge, the SAE Passenger-Car Activity Committee asked Studebaker's chief engineer, William S. James, to gather material from leading car manufacturing plants on their experience in conversion to iron or steel pistons.

In the May SAE Journal, automotive engineers, both military and civilian, will find a compilation of case studies which should be invaluable. Watch for the James round-up.



SAE SUMMER MEETING

May 31-June 5

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Springs
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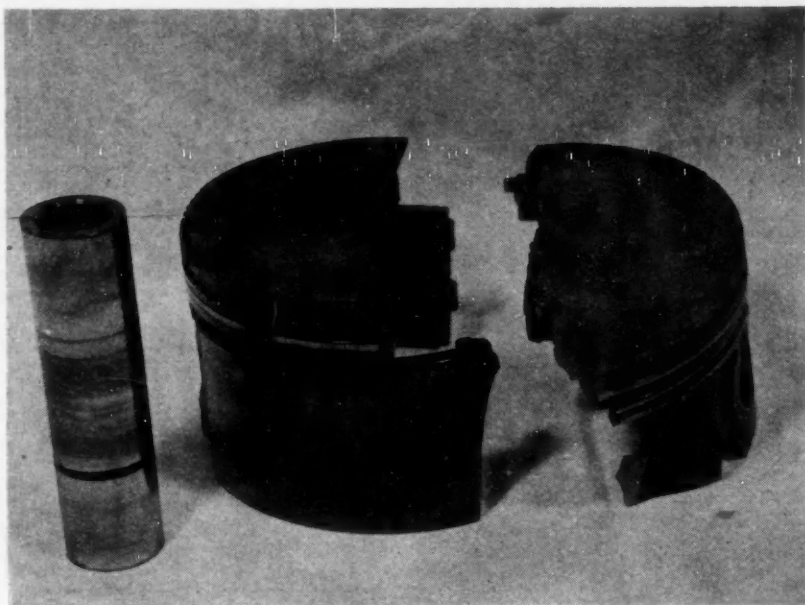
Horsepower Maintained With Lower-Octane Fuels

WHEN we spoke in April Pre-Prints of the Sword of Damocles hanging over the transportation industry in the form of lowered octane ratings, we did not mention how light airplanes would fare under such war fuel restrictions.

Situation Similar

The situation is dangerously similar, according to Carl T. Doman, Aircooled Motors Corp., in a follow-up article to appear in the forthcoming SAE Journal. Lowering octane ratings of light aircraft fuels to give

(Concluded on page 10)



DISASTROUS EFFECTS can come from using lower octane gasoline in a light aircraft engine on which suitable changes have not been made. Observe the picture above. Author Doman (*Light Plane Engines and Their Fuel Problems*) says: "Thirty minutes of operation on an engine, using 73-octane fuel instead of 80, resulted in a piston cracking. At the same time decided corrosion was present in the cylinder-head pocket around the inlet valve. Both the exhaust valves were badly warped."

NEWS NIBLETS

FROM THE SAE JOURNAL

Seventy-five per cent of the production capacity of Canadian industry is devoted to war work.

— Louis Blake Duff,
Niagara Finance Corp.

To produce enough synthetic rubber to replace natural rubber imports of 87,916 tons per month would require a capital investment of approximately 1½ billion dollars.

— E. Waldo Stein,
Firestone Tire & Rubber Co.

How English motorists save gas: There is an electrical contact on the carburetor and a red light on the dash. If the motorist drives by the light he can save 15% and sometimes more.

— Alex Taub

Tin cans will be used to leach out or lixiviate copper from mine water in new WPB metals program. The process is an ancient art revived by war, had no economic value in the days of peace.

— War Impact on Industry

Today they are making plastic cartridge shells for defense, thus conserving valuable copper.

— H. A. Frommelt,
Kearney & Trecker Corp.

Reducing the amount of scarce materials in armament is a definite policy in the War Production Board, government officials tell the SAE Journal.

— War Impact on Industry

Horsepower Maintained

(Concluded from page 9)

the lighter portions to their big, fighting brothers, and increasing their content of tetraethyl lead, mean engine rearrangement or redesign to maintain the same power output, he says.

Author Doman's paper deals with five specific points which light aircraft-engine designers can attack in finding the solution to the problem. They are:

- Increased displacement
- Improvement in installations in airplanes
- Improvement in induction systems, manifold, etc.
- Changes in cam timing
- Improved cooling of the cylinder and piston

It includes a wealth of test data on work already done on these five points to guide SAE Journal readers.

Manufacturers of light aircraft engines, air frames, or propellers, as well as fuel refiners will not want to miss "Light Plane Engines and Their Fuel Problems" in May.



Oil "Fifth Column" Attacked by Engineers

TRAGIC disasters resulting from "fifth column" activities have taught the Allies that the best defense against such subversive movements is to clear out the suspects before they strike rather than wait for attacks to get under way and then attempt to break them up.

The "fifth columnists" of engine efficiency are the contaminants that develop in the lubricating oil. One method of dealing with them is to dissolve into the oil through additives, these unwanted formations that develop on engine parts. While this method has prolonged the life of engines and oil considerably, it has not been the complete answer, because the contaminants, though dissolved for a lengthened period, still exist in the oil and, at a later date, reform at an accelerated pace.

Developing an oil that will eliminate this lubricant "fifth column" before it gets under way is no easy task, four Continental Oil engineers confirm in the May SAE Journal. Speed, temperature, load, air, combustion zone, cooling system, and extraneous material from the fuel itself—any, or all, of these may be the source of oil contamination, they point out.

But, through comprehensive laboratory and road tests which these SAE Journal authors have conducted, the day is nearer when this all-important factor can be fully controlled.

